Access DB# 220925

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Carrie Thompson Examiner # : 79244 Date: 4/2/07
Art Unit: 1774 Phone Number ~~30~~ 571-272-1530 Serial Number: ~~10/413,778~~
Mail Box and Bldg/Room Location: Rem 10 D28 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need. Serial # 10/649,282

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Fine Grained Rare Earth activated Zinc Sulfide

Inventors (please provide full names): Guo Liu; Alexander Kosyachkov; Yue Xu; James Stiles

Earliest Priority Filing Date: 8/29/02

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please do a search on all claims. but close attention to Claim 1

ZnS: Eu or Tb wherein crystal size dimension is up to about to 50nm and ratio of Tb or Eu to zinc is 0.005 to 0.02.

Thanks

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Cntr
APR 0 4 RECD
Pat. & T.M Office

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STAFF USE ONLY		**Type of Search**		**Vendors and cost where applicable**
Searcher:	EL	NA Sequence (#)		STN
Searcher Phone #:		AA Sequence (#)		Dialog
Searcher Location:		Structure (#)		Questel/Orbit
Date Searcher Picked Up:		Bibliographic		Dr.Link
Date Completed:	4-6-07	Litigation		Lexis/Nexis
Searcher Prep & Review Time:		Fulltext		Sequence Systems
Clerical Prep Time:		Patent Family		WWW/Internet
Online Time:		Other		Other (specify)

PTO-1590 (8-01)

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) An improved phosphor for a thick film electroluminescent display, said phosphor comprising;
- a thin film rare earth metal activated zinc sulfide phosphor, wherein said phosphor is fine grained and has a crystal grain dimension of up to about 50 nm; wherein said rare earth metal activated zinc sulfide phosphor layer has the formula ZnS:RE, wherein RE is a selected from the group consisting of terbium and europium, and wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

2. (Cancelled)

3. (Previously Presented) The phosphor of claim 1 , wherein said zinc sulfide phosphor has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

4. (Cancelled)

5. (Cancelled)

6. (Currently amended) The phosphor of claim 1 ~~5~~, wherein said zinc sulfide phosphor has a sphalerite crystal structure.

7. (Currently amended) The phosphor of claim 1 ~~5~~, wherein said zinc sulfide phosphor is provided as a thin layer with a thickness of about 0.5 to about 1.0 μm.

8. (Original) The phosphor of claim 7, wherein said zinc phosphor is deposited by a method selected from the group consisting of chemical vapour deposition, electron beam deposition and sputtering.

9. (Original) The phosphor of claim 8, wherein said phosphor is deposited by a sputtering process comprising;

- depositing said phosphor onto a substrate in an atmosphere comprising argon at a working pressure in the range of about 0.5 to 5×10^{-2} torr and an oxygen partial pressure of less than about 0.05 of the working pressure, said substrate maintained at a temperature between ambient temperature and about 300°C, at a deposition rate in the range of about 5 to 100 Angstroms per second, wherein the atomic ratio of the rare earth metal to zinc in the source material is in the range of about 0.5 to 2 percent.

10. (Previously Presented) An electroluminescent device comprising the phosphor of claim 8 wherein said device comprises;

- a structure and/or substance to minimize or prevent reaction of said fine grained phosphor with oxygen.

11. (Previously Presented) The electroluminescent device of claim 10, wherein said structure or substance comprises one or more of;

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device;

ii) a hermetic enclosure for the electroluminescent device; and

iii) an oxygen getter incorporated into the device.

12. (Previously Presented) The electroluminescent device of claim 11, wherein said interface modifying layer is selected from a material selected from the group consisting of pure zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that is deposited using atomic layer epitaxy.

13. (Previously Presented) The electroluminescent device of claim 12, wherein said interface modifying layer is silicon nitride.

14. (Previously Presented) The electroluminescent device of claim 12, wherein said interface modifying layer is pure zinc sulfide.

15. (Previously Presented) The electroluminescent device of claim 11, wherein said hermetic enclosure is an optically transparent cover plate disposed over said device.

16. (Previously Presented) The electroluminescent device of claim 15, wherein said cover plate consists of glass .

17. (Previously Presented) The electroluminescent device of claim 16, wherein said cover plate is sealed with a sealing bead formed using glass frit.

18. (Previously Presented) The electroluminescent device of claim 16, wherein said sealing bead comprises a polymeric material.

19. (Previously Presented) The electroluminescent device of claim 11, wherein said hermetic enclosure is an oxygen-impermeable sealing layer deposited over said device.

20. (Previously Presented) The electroluminescent device of claim 19, wherein said oxygen-impermeable sealing layer is of glass formed from a glass frit composition.

21. (original) A thick film dielectric electroluminescent device comprising;

- a thin phosphor layer of formula ZnS:Re, wherein said phosphor layer has a crystal grain size of up to about 50nm and Re is selected from terbium and europium; and

- a structure and/or substance to minimize or prevent reaction of the fine grained phosphor with oxygen, wherein said structure or substance comprises one or more of;

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device;

ii) a hermetic enclosure for the electroluminescent device; and

iii) an oxygen getter incorporated into the device.

22. (original) The device of claim 21, wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

23. (original) The device of claim 22, wherein said zinc sulfide phosphor layer has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

24. (original) The device of claim 23, wherein said zinc sulfide phosphor layer has a sphalerite crystal structure.

25. (original) The device of claim 23, wherein said zinc sulfide phosphor layer has a thickness of about 0.5 to about 1.0 μm.

26. (original) The device of claim 25, wherein said zinc sulfide phosphor layer is deposited by a method selected from the group consisting of chemical vapour deposition, electron beam deposition and sputtering.

27. (original) The device of claim 26, wherein said structure is deposited by a sputtering process and comprises

- depositing said phosphor layer onto a substrate in an atmosphere comprising argon at a working pressure in the range of about 0.5 to 5 x 10^{-2} torr and an oxygen partial pressure of less than about 0.05 of the working pressure, said substrate maintained at a temperature between ambient temperature and about 300°C; at a deposition rate in the range of about 10 to 100 Angstroms per second, wherein the atomic ratio of the rare earth metal to zinc in the source material is in the range of about 0.5 to 2 percent.

28. (original) The device of claim 27, wherein said interface modifying layer is selected from a material selected from the group consisting of pure zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that deposited using atomic layer epitaxy.

29. (original) The device of claim 28, wherein said interface modifying layer is zinc sulfide.

30. (original) The device of claim 29, wherein said interface modifying layer is silicon nitride.

31. (original) The device of claim 30, wherein said phosphor layer is deposited on a substrate selected from a thick dielectric layer deposited on glass and a thick dielectric layer deposited on ceramic.

32. (Withdrawn) A method for depositing and stabilizing a fine grained rare earth metal activated zinc sulfide phosphor, said method comprising;

- providing an interface modifying layer adjacent one or both sides of said phosphor.

33. (Withdrawn) The method of claim 32, wherein said interface modifying layer is selected from a material selected from the group consisting of pure zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that deposited using atomic layer epitaxy.

34. (Withdrawn) The method of claim 33, wherein said interface modifying layer is zinc sulfide.

35. (Withdrawn) The method of claim 34, wherein said interface modifying layer is silicon nitride.

36. (Withdrawn) The method of claim 35, wherein said rare earth metal activated zinc sulfide phosphor has the formula ZnS:RE, wherein RE is a selected from the group consisting of terbium and europium.

37. (Withdrawn) The method of claim 36, wherein said zinc phosphor has a crystal grain dimension of up to about 50nm.

38. (Withdrawn) The method of claim 36, wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

39. (Withdrawn) The method of claim 38, wherein said zinc sulfide phosphor has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

40. (Withdrawn) The method of claim 37, wherein said zinc sulfide phosphor has a sphalerite crystal structure.

41. (Withdrawn) The method of claim 39, wherein said zinc sulfide phosphor layer has a thickness of about 0.5 to about 1.0 μm.

42. (original) A thick film dielectric electroluminescent device comprising;

- a 0.5 to 1.0μm thick phosphor layer of formula ZnS:Re, wherein said phosphor layer has a sphalerite crystal structure with a crystal grain size of up to about 50nm and Re is selected from terbium and europium; and

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device, wherein said interface modifying layers are comprised of pure zinc sulfide or silicon nitride.

43. (original) The device of claim 42, wherein said device additionally comprises a hermetic enclosure over said device.

44. (original) The device of claim 43, wherein said device additionally comprises an oxygen getter.

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=> FILE REG
FILE 'REGISTRY' ENTERED AT 15:22:37 ON 06 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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=> DISPLAY HISTORY FULL L1-

     FILE 'HCAPLUS' ENTERED AT 14:58:09 ON 06 APR 2007
L1        301187 SEA LIU ?/AU
L2           106 SEA KOSYACHKOV ?/AU
L3        151464 SEA XU ?/AU
L4          1809 SEA STILES ?/AU
L5             1 SEA L1 AND L2 AND L3 AND L4

     FILE 'REGISTRY' ENTERED AT 14:58:59 ON 06 APR 2007
L6             1 SEA 1314-98-3
L7           140 SEA (ZN(L)S)/ELS (L) 2/ELC.SUB
L8             1 SEA 7440-27-9
L9             1 SEA 7440-53-1

     FILE 'HCA' ENTERED AT 15:00:57 ON 06 APR 2007
L10        35416 SEA L6 OR L7
L11        25737 SEA L8
L12        40224 SEA L9
L13        59223 SEA PHOSPHOR# OR PHOSPHORES?
L14       296885 SEA LUM!N?
L15       117034 SEA (ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR ORGANO
                 OR ORG#)(2A)LUM!N? OR LIGHT?(2A)(EMIT? OR EMISSION?) OR
                 EL OR E(W)L OR L(W)E(W)D OR OLED)/BI,AB OR LED/IT
L16          506 SEA L10 AND L11
L17          889 SEA L10 AND L12
L18          425 SEA L16 AND (L13 OR L14 OR L15)
L19          765 SEA L17 AND (L13 OR L14 OR L15)
L20              QUE CRYST? OR RECRYST?
L21       126104 SEA NANOCRYST? OR NANO?(2A)CRYST? OR MICROCRYST? OR
                 MICRO?(2A)CRYST?
L22        17215 SEA ATOMIC?(2A)(RATIO? OR PROPORTION? OR FRACTION?)
L23        43436 SEA FINEGRAIN? OR FINE#(2A)GRAIN?
L24       395245 SEA INTERFAC?
L25           59 SEA L18 AND L20
L26           27 SEA L18 AND L21
L27            8 SEA L18 AND L22
L28            1 SEA L18 AND L23
L29            2 SEA L16 AND L23
L30           12 SEA L18 AND L24
L31           88 SEA L19 AND L20
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L32            28 SEA L19 AND L21
L33             3 SEA L19 AND L22
L34             1 SEA L19 AND L23
L35             4 SEA L17 AND L23
L36             6 SEA L19 AND L24

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     FILE 'HCA' ENTERED AT 15:13:47 ON 06 APR 2007
L38             4 SEA L37
L39             4 SEA L38 AND (L13 OR L14 OR L15 OR L20 OR L21 OR L22 OR
                  L23 OR L24)
L40           149 SEA ZNS(2W)(EU OR TB OR EUROPIUM# OR TERBIUM#)
L41           142 SEA L40 AND (L13 OR L14 OR L15 OR L20 OR L21 OR L22 OR
                  L23 OR L24)
L42           140 SEA L40 AND (L13 OR L14 OR L15)
L43            57 SEA L42 AND (L20 OR L21 OR L22 OR L23 OR L24)
L44            23 SEA L42 AND (L21 OR L22 OR L23 OR L24)
L45             9 SEA L42 AND (L22 OR L23 OR L24)
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L47             1 SEA L18 AND L46
L48             2 SEA L19 AND L46
L49             0 SEA L38 AND L46
L50             2 SEA L40 AND L46
L51            33 SEA L27 OR L28 OR L29 OR L39 OR L45 OR L47 OR L48 OR L50
                  OR L33 OR L34 OR L35 OR L36
L52            40 SEA (L26 OR L44 OR L32) NOT L51
L53            30 SEA 1840-2002/PY,PRY AND L51
L54            24 SEA 1840-2002/PY,PRY AND L52
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=> FILE HCA
FILE 'HCA' ENTERED AT 15:23:14 ON 06 APR 2007

=> D L53 1-30 CBIB ABS HITSTR HITIND

L53 ANSWER 1 OF 30 HCA COPYRIGHT 2007 ACS on STN
140:243299 **Fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays. Liu, Guo; Kosyachkov, Alexander; Xu, Helen; Stiles, Jim (Ifire Technology Inc., Can.). PCT Int. Appl. WO 2004021745 A1

20040311, 50 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-CA1266 20030825. PRIORITY: US 2002-406661P 20020829.

AB **Phosphors** for use in **electroluminescent** displays are described which comprise a **fine-grained** rare earth metal-activated zinc sulfide film. The **phosphor** film may be used in conjunction with a structure or substance to minimize or prevent reaction of the **fine grained** **phosphor** with oxygen. The structure or substance may comprise ≥1 of **interface**-modifying layers (e.g., of pure zinc sulfide, hydroxy ion-free alumina, aluminum nitride, silicon nitride and aluminum oxide that is deposited using at. layer epitaxy) on one or both sides of the **phosphor** film to improve the stability of the **interface** between the **phosphor** film and the rest of the device; a hermetic enclosure for the **electroluminescent** device; and an oxygen getter incorporated into the device. Methods for depositing and stabilizing the **phosphors** are also described which entail providing an **interface** modifying layer adjacent one or both sides of the **phosphor**. Thick film dielec. **electroluminescent** devices comprising the films are also described.

IT **1314-98-3**, Zinc sulfide, uses
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-27-9**, Terbium, uses
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

IT **7440-53-1**, Europium, uses
(**fine-grained** rare earth-activated zinc sulfide **phosphors** for **electroluminescent** displays)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IC ICM H05B033-10
ICS H05B033-22; C09K011-84
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
ST fine rare earth activated zinc sulfide **phosphor** **electroluminescent** display
IT **Electroluminescent** devices
(displays; **fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT **Luminescent** screens
(**electroluminescent; fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT **Electroluminescent** devices
Phosphors
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT Rare earth metals, uses
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT **1314-98-3**, Zinc sulfide, uses 1344-28-1, Alumina, uses 12033-89-5, Silicon nitride, uses 24304-00-5, Aluminum nitride
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT **7440-27-9**, Terbium, uses
(**fine-grained** rare earth activated zinc sulfide **phosphors** for **electroluminescent** displays)
IT **7440-53-1**, Europium, uses
(**fine-grained** rare earth-activated zinc sulfide **phosphors** for **electroluminescent** displays)

L53 ANSWER 2 OF 30 HCA COPYRIGHT 2007 ACS on STN
139:388275 **Electroluminescent** multilayer thin film and **electroluminescent** device using it. Mori, Masami; Yano, Yoshihiko (TDK Corporation, Japan). Jpn. Kokai Tokkyo Koho JP 2003332081 A 20031121, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-138383 20020514.

AB The thin film has a **phosphor** layer contg. matrix and **luminescent** center, a sulfide-contg. buffer layer with thickness 30-300 nm, and an oxide-contg. barrier layer with thickness 5-150 nm laminated in this order on a substrate, where the **at. ratio** of O of the oxide in the barrier layer is >94 and <100% to the stoichiometric compn. The thin film **emits light** with high and stable brightness and has long life. **Electroluminescent** devices having the thin film are useful for color **electroluminescent** display panels.

IT **1314-98-3**, Zinc sulfide (ZnS), uses
(buffer layer; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, uses
(**luminescent** center, **phosphor** layer contg.; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IC ICM H05B033-22
ICS C09K011-00; C09K011-62; C09K011-64; H05B033-14; H05B033-20

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST oxygen deficient oxide barrier layer **electroluminescent** **phosphor** film; **electroluminescent** device brightness long life

IT **Phosphors**
(multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent**

device with high brightness)
IT **Electroluminescent** devices
(thin-film; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)
IT 431060-51-4P, Aluminum barium sulfur oxide
(Eu-activated, **phosphor** layer; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)
IT 1344-28-1D, Alumina, oxygen-deficient, uses
(barrier layer; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)
IT **1314-98-3**, Zinc sulfide (ZnS), uses
(buffer layer; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)
IT **7440-53-1**, Europium, uses
(**luminescent** center, **phosphor** layer contg.; multilayer thin film having **phosphor** layer and O-deficient oxide barrier layer for **electroluminescent** device with high brightness)

L53 ANSWER 3 OF 30 HCA COPYRIGHT 2007 ACS on STN
139:171100 **Phosphor** thin film, preparation method, and **EL** panel. Yano, Yoshihiko; Oike, Tomoyuki; Takahashi, Masaki; Nagano, Katsuto (TDK Corporation, Japan; The Westaim Corporation). U.S. Pat. Appl. Publ. US 2003146691 A1 20030807, 14 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-358345 20030205. PRIORITY: JP 2002-381967 20021227; JP 2002-30133 20020206.
AB A **phosphor** film comprising a matrix material and a **luminescence** center, is described wherein the matrix material has the compositional formula MIIvAxByOzSw (MII = Zn, Cd or Hg; A = Mg, Ca, Sr, Ba or rare earth element; B = Al, Ga or In; and **at. ratios** v, x, y, z and w are $0.005 \leq v \leq 5$, $1 \leq x \leq 5$, $1 \leq y \leq 15$, $0 < z \leq 30$, and $0 < w \leq 30$). An **electroluminescent** panel having the **phosphor** film may provide a quality panel formed at low cost by a low-temp. process. A method of fabricating the **phosphor** film is also described.
IT **1314-98-3**, Zinc sulfide (ZnS), uses
(barrier layer; **phosphor** film, prepn. method, and **EL** panel)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, uses
(**phosphor** film, prepn. method, and **EL** panel)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IC ICM H05B033-00
ICS H01J001-62
INCL 313503000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76
ST **phosphor** film **EL** panel; gallium strontium zinc oxide sulfide **phosphor** film; aluminum barium zinc oxide sulfide **phosphor** film
IT **Electroluminescent** devices
(panels; **phosphor** film, prepn. method, and **EL** panel)
IT **Phosphors**
(**phosphor** film, prepn. method, and **EL** panel)
IT **1314-98-3**, Zinc sulfide (ZnS), uses 1344-28-1, Alumina, uses
(barrier layer; **phosphor** film, prepn. method, and **EL** panel)
IT **7440-53-1**, Europium, uses
(**phosphor** film, prepn. method, and **EL** panel)
IT 573945-70-7, Gallium strontium sulfur zinc oxide
(**phosphor** film, prepn. method, and **EL** panel)
IT 573945-71-8, Gallium strontium oxide sulfide (Ga2Sr(O,S)4)
573945-72-9, Aluminum barium sulfur zinc oxide 573945-73-0, Aluminum barium oxide sulfide (Al2Ba(O,S)4)
(**phosphor**; **phosphor** film, prepn. method, and **EL** panel)
IT 12047-27-7, Barium titanate (BaTiO3), uses 12060-00-3, Lead titanium oxide (PbTiO3)
(substrate and insulating layer; **phosphor** film, prepn. method, and **EL** panel)

L53 ANSWER 4 OF 30 HCA COPYRIGHT 2007 ACS on STN
138:63165 Synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles. Wang, Zhao-Xia; Zhang, Lei Z.; Xiong, Ying; Tang, Guo-Qing; Zhang, Gui-lan; Chen, Wen-Ju (Inst. Modern Optics, Opto-electronic

Information Sci. Technology Lab., MOE, Nankai Univ., Tianjin, 300071, Peop. Rep. China). Journal of Chemical Research, Synopses (7), 348-350 (English) **2002.** CODEN: JRPSDC. ISSN: 0308-2342. Publisher: Science Reviews.

AB Eu-doped ZnS semiconductor nanoparticles were successfully prepd. by using a new method - single-phase pptn. and solid-state reaction.

IT **1314-98-3P**, Zinc sulfide (**ZnS**), properties
(**europium**-doped nanoparticles; synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, properties
(zinc sulfide nanoparticles doped with; synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75, 76

IT **Sphalerite**-type crystals
(site symmetry in; synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

IT **Luminescence**
(visible; synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

IT **1314-98-3P**, Zinc sulfide (**ZnS**), properties
(**europium**-doped nanoparticles; synthetic effects on site symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

IT **7440-53-1**, Europium, properties
(zinc sulfide nanoparticles doped with; synthetic effects on site

symmetry and photoluminescence properties of Eu-doped ZnS semiconductor nanoparticles prepd. by single-phase pptn. and solid-state reaction)

L53 ANSWER 5 OF 30 HCA COPYRIGHT 2007 ACS on STN
135:282235 Chemical inhomogeneity in materials with f-elements: observation and interpretation. Vasilyeva, I. G. (Institute of Inorganic Chemistry, Siberian Branch, Russian Academy of Sciences, Novosibirsk, 630090, Russia). Journal of Alloys and Compounds, 323-324, 34-38 (English) **2001.** CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science S.A..

AB Materials such as thin films ZnS·EuS/Si and YBa2Cu3Ox/sapphire, **crystals** TmBa2Cu3Ox·CaO and YBa2Cu3Ox and also powders γ-Ce2S3·Na2S and LaFeO3·CaO were analyzed and their differential dissoln. (DD) patterns and dissoln. kinetics were collected. The origin of the local inhomogeneities was established by anal. of these data. The inhomogeneity manifested itself as sep. phases, as spatial compositional nonuniformity of solid solns., as the grain surface enriched by doping elements, as nonstoichiometry produced by undesired doping with the container or substrate elements. In all cases, the DD results were compared with those obtained by other assessment techniques.

IT **363167-17-3**, Europium zinc sulfide
(inhomogeneity of f element film, **crystal** and powder compds. analyzed with differential dissoln. and dissoln. kinetics)

RN 363167-17-3 HCA

CN Europium zinc sulfide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	x	7704-34-9
Zn	x	7440-66-6
Eu	x	7440-53-1

CC 78-9 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 79

ST inhomogeneity f element material differential dissoln; film inhomogeneity differential dissoln analysis; **crystal** inhomogeneity differential dissoln analysis; powder inhomogeneity differential dissoln analysis

IT Dissolution
Dissolution rate
(inhomogeneity of f element film, **crystal** and powder compds. analyzed with differential dissoln. and dissoln. kinetics)

IT Heterogeneity
(of f element film, **crystal** and powder compds. analyzed with differential dissoln. and dissoln. kinetics)
IT 7429-90-5, Aluminum, occurrence 7440-39-3, Barium, occurrence 7440-50-8, Copper, occurrence
(inhomogeneity of f element film, **crystal** and powder compds. analyzed with differential dissoln. and dissoln. kinetics)
IT 1305-78-8D, Calcium oxide, doped barium copper thulium oxide 107539-20-8, Barium copper yttrium oxide 110687-34-8D, Barium copper thulium oxide, calcium oxide doped **363167-17-3**, Europium zinc sulfide
(inhomogeneity of f element film, **crystal** and powder compds. analyzed with differential dissoln. and dissoln. kinetics)

L53 ANSWER 6 OF 30 HCA COPYRIGHT 2007 ACS on STN
135:160001 A method of production of a thin film **electroluminescent** device. Cranton, Wayne Mark; Stevens, Robert; Thomas, Clive; Mastio, Emmanuel Antoine; Reehal, Hari (Nottingham Consultants Limited, UK). PCT Int. Appl. WO 2001058220 A1 **20010809**, 19 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-GB295 20010126. PRIORITY: GB 2000-2231 20000201.
AB Methods of fabricating thin film **electroluminescent** devices are described which entail providing a substrate; providing a conductor on the substrate; providing a dielec. layer on the conductor; providing a **phosphor** layer on the dielec. layer, creating a **phosphor**/dielec. **interface** region that comprises a plurality of electron **interface** states; and transiently laser annealing the **phosphor** layer so as to induce an in depth annealing effect in the **phosphor** layer without heating the **phosphor**/dielec. region above a temp. which induces a substantial modification in the distribution of electron **interface** states.
IT **7440-53-1**, Europium, uses
(thin-film **electroluminescent** device prodn.)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT 1314-98-3, Zinc sulfide, uses
(thin-film **electroluminescent** device prodn.)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM H05B033-10
ICS H05B033-14
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST thin film **electroluminescent** device prodn
IT Laser annealing
(in thin-film **electroluminescent** device prodn.)
IT **Electroluminescent** devices
Semiconductor device fabrication
(thin-film **electroluminescent** device prodn.)
IT 7439-96-5, Manganese, uses 7440-27-9, Terbium, uses 7440-30-4, Thulium, uses 7440-45-1, Cerium, uses 7440-52-0, Erbium, uses **7440-53-1**, Europium, uses 63943-99-7, Thulium fluoride (TmF)
(thin-film **electroluminescent** device prodn.)
IT 1314-13-2, Zinc oxide (ZnO), uses 1314-36-9, Yttria, uses 1314-96-1, Strontium sulfide **1314-98-3**, Zinc sulfide, uses 12005-21-9, Yttrium aluminum garnet
(thin-film **electroluminescent** device prodn.)

L53 ANSWER 7 OF 30 HCA COPYRIGHT 2007 ACS on STN
133:315131 Electrical characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices. Neyts, K.; Meuret, Y.; Stuyven, G.; De Visschere, P.; Moehnke, S. (ELIS Department, Ghent University, Ghent, B-9000, Belg.). Journal of Applied Physics, 88(5), 2906-2911 (English) **2000.** CODEN: JAPIAU. ISSN: 0021-8979. Publisher: American Institute of Physics.
AB Thin-film **electroluminescent** devices with double or triple **phosphor** layers were used to produce a bright white emission. With the blue emitting SrS:Cu, the blue and green emitting SrS:Ce, the green emitting **ZnS**:**Tb**, and the green and red emitting ZnS:Mn, several white emitting combinations can be obtained. The elec. field and electron current in such a multilayer **phosphor** are often not homogeneous. Combined elec. and optical measurements show that the field at the

cathodic side of the **phosphor** is normally larger than at the anodic side, due to pos. space charge in the **phosphor** layer. At low applied voltages, electrons can be trapped in the multilayer before reaching the anodic insulator **interface.** A part of the **phosphor** layer is then not excited, and this disturbs the balance of colors emitted from the multilayer **phosphor** device.

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

ST elec white strontium sulfide zinc sulfide multilayer **electroluminescent** device; thin film **electroluminescent** device electron trapping

IT Conduction band
Electroluminescent devices
Luminescence, electroluminescence
Phosphors
(elec. characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices)

IT Trapping
(of electrons; elec. characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices)

IT 7429-90-5, Aluminum, uses 13463-67-7, Titanium dioxide, uses 50926-11-9, Indium tin oxide
(elec. characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices)

IT 7439-96-5, Manganese, properties 7440-27-9, Terbium, properties 7440-45-1, Cerium, properties 7440-50-8, Copper, properties
(elec. characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices)

IT 1314-96-1, Strontium sulfide 1314-98-3, Zinc sulfide, properties
(elec. characterization of white SrS/ZnS multilayer thin-film **electroluminescent** devices)

L53 ANSWER 8 OF 30 HCA

131:315648 Thin-film **EL** panels, their manufacture, and color **EL** panel devices. Tanaka, Koichi; Terada, Kosuke; Kawamura, Yukinori; Kato, Hisato; Nakamata, Shinichi; Urushidani, Tanio (Sharp Corp., Japan; Fuji Electric Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 11307257 A **19991105** Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-109431 19980420.

AB The panels contain multiple nos. of **light-emitting** layers sandwiched between elec. insulating layers and electrodes formed thereon. The **light-emitting** layers comprise doped alk. earth metal sulfide 1st **light-emitting** layer and a doped Zn sulfide 2nd **light-emitting** layer with a nondoped Zn sulfide layer formed in-between the 1st and the 2nd **light-emitting**

layers. Manuf. of the panels comprising a SrS 1st **light-emitting** layer and a Mn-doped Zn sulfide 2nd **light-emitting** layer is carried out by lamination of the SrS layer, nondoped Zn sulfide layer, and Mn-doped Zn sulfide layer in the order followed by annealing, with controlling the Mn concn. in the Zn sulfide layer to be higher in the **interface** between the nondoped Zn sulfide layer than in the other part of the layer. Color **EL** panel devices comprising the above stated panels and color filters are also claimed. Damaging of the **light-emitting** layers with water and etchant during device fabrication is prevented by formation of the nondoped Zn sulfide etch stopping layer.

IT **7440-53-1**, Europium, uses
(dopant; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, uses
(etch-stopping layer and **light-emitting** layer; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM H05B033-14
ICS H05B033-10; H05B033-22

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74

ST thin film **EL** color panel device; zinc sulfide nondoped etch stopping layer; alk earth sulfide **EL** panel

IT Etching
(-stopping layer; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT Annealing
(in manuf. of thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT Alkaline earth chalcogenides

(sulfide, **light-emitting** layers; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT **Electroluminescent** devices
(thin-film, color; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT 7439-96-5, Manganese, uses **7440-53-1**, Europium, uses 25764-08-3, Cerium nitride (CeN)
(dopant; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT 1314-96-1, Strontium sulfide 20548-54-3, Calcium sulfide
(doped, **light-emitting** layer; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

IT **1314-98-3**, Zinc sulfide, uses
(etch-stopping layer and **light-emitting** layer; thin-film color **EL** panels with ZnS etch-stopping layers in-between **light-emitting** layers)

L53 ANSWER 9 OF 30 HCA COPYRIGHT 2007 ACS on STN

131:108730 **Electroluminescent** devices and manufacture thereof.
Naito, Masaru; Inoguchi, Kazuhiro; Komura, Tsukasa (Denso Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11185969 A **19990709** Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-348235 19971217.

AB The devices comprise: (1) a substrate (glass); (2) a 1st electrode (ITO); (3) an insulator layer (Ta2O5-SnO2); (4) an active layer (**ZnS:Tb**); and (5) a 2nd electrode (Al), where the surface of (3) **interfacing** with (4) is coarsened to 100-400 nm high by dry etching (CF4 and O2) or by sputtering.

IC ICM H05B033-22
ICS H05B033-10

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **electroluminescent** zinc sulfide tantalum tin oxide coarsened surface

IT **Electroluminescent** devices
(**electroluminescence** devices and manuf.)

IT Glass, uses
(**electroluminescence** devices and manuf.)

IT 1314-61-0, Tantalum oxide (Ta2O5) 1314-98-3, Zinc sulfide (ZnS), uses 7429-90-5, Aluminum, uses 18282-10-5, Tin oxide (SnO2) 50926-11-9, ITO
(**electroluminescence** devices and manuf.)

IT 7440-27-9, Terbium, uses
(**electroluminescence** devices and manuf.)

IT 75-73-0, Tetrafluoromethane 7782-44-7, Oxygen, reactions
(**electroluminescence** devices and manuf.)

L53 ANSWER 10 OF 30 HCA COPYRIGHT 2007 ACS on STN
130:189128 **Electroluminescent** device for segment and matrix displays. Kanemura, Takashi; Kanazawa, Shigeo; Hattori, Tadashi (Nippon Denso Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11040364 A **19990212** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-191569 19970716.

AB An **electroluminescent** device, suited for use in segment and matrix displays, comprise a **light-emitting** layer mainly composed of ZnS, wherein the **at. ration** of Fe to the **light-emitting** element, typically Mn and Tb, is $\leq$0.001 for enhancing the **emitting light** intensity.

IT **1314-98-3**, Zinc sulfide, uses
(**electroluminescent** device for segment and matrix displays)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, uses
(**electroluminescent** device for segment and matrix displays)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

IC ICM H05B033-18
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **electroluminescent** device zinc sulfide manganese terbium iron
IT **Electroluminescent** devices
(**electroluminescent** device for segment and matrix displays)
IT **1314-98-3**, Zinc sulfide, uses
(**electroluminescent** device for segment and matrix displays)
IT 7439-89-6, Iron, uses 7439-96-5, Manganese, uses **7440-27-9**
, Terbium, uses
(**electroluminescent** device for segment and matrix displays)

L53 ANSWER 11 OF 30 HCA COPYRIGHT 2007 ACS on STN
129:73816 Stabilized **phosphor.** Petersen, Ronald O.; Trottier, Troy A. (Motorola, Inc., USA). Eur. Pat. Appl. EP 848050 A2 **19980617**, 8 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI. (English). CODEN: EPXXDW. APPLICATION: EP 1997-121221 19971203. PRIORITY: US 1996-764172 19961213.

AB Stabilized sulfide/oxide **phosphors** suitable for use in field emission displays include a sulfide/oxide **phosphor** core surrounded by a stabilized surface which is more thermodynamically stable against outgassing (e.g., of sulfur or oxygen) at a solid-vacuum **interface** than the core. The stabilized surface may comprise a phosphate, gallate, chromate, vanadate, silicate, or stannate.

IT **7440-53-1**, Europium, uses
(surface-stabilized **phosphors** activated with)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, uses
(surface-stabilized **phosphors** based on)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM C09K011-02
ICS C09K011-78; C09K011-84; C09K011-56
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST stabilized cathodoluminescent **phosphor**; oxide stabilized cathodoluminescent **phosphor**; sulfide stabilized cathodoluminescent **phosphor**
IT **Phosphors**
(cathodoluminescent; surface-stabilized **phosphors**)
IT Group IIIA element compounds
(gallates; **phosphors** with surfaces stabilized by)
IT Rare earth oxides
(halides; surface-stabilized **phosphors** based on)
IT Rare earth halides
Rare earth sulfides
(oxides; surface-stabilized **phosphors** based on)
IT Chromates

Phosphates, uses
Silicates, uses
(**phosphors** with surfaces stabilized by)
IT Group IVA element compounds
(stannates; **phosphors** with surfaces stabilized by)
IT Rare earth oxides
(sulfides; surface-stabilized **phosphors** based on)
IT Alkaline earth compounds
(thiogallates; surface-stabilized **phosphors** based on)
IT Group VB element compounds
(vanadates; **phosphors** with surfaces stabilized by)
IT 18282-10-5, Tin dioxide
(**phosphors** with surfaces stabilized by)
IT 7429-91-6, Dysprosium, uses 7439-96-5, Manganese, uses 7440-00-8, Neodymium, uses 7440-10-0, Praseodymium, uses 7440-19-9, Samarium, uses 7440-27-9, Terbium, uses 7440-30-4, Thulium, uses 7440-45-1, Cerium, uses 7440-52-0, Erbium, uses **7440-53-1**, Europium, uses 7440-60-0, Holmium, uses 7440-64-4, Ytterbium, uses
(surface-stabilized **phosphors** activated with)
IT 1314-36-9, Yttria, uses **1314-98-3**, Zinc sulfide, uses 12005-21-9, Yttrium aluminate (Y3Al5O12) 12027-88-2, Yttrium silicate (Y2SiO5)
(surface-stabilized **phosphors** based on)

L53 ANSWER 12 OF 30 HCA COPYRIGHT 2007 ACS on STN
128:264110 Study of the phase states for Zn-Eu-S system thin films obtained by CVD method. Bessergenev, V. G.; Ivanova, E. N.; Kovalevskaya, Yu. A.; Vasilieva, I. G. (Institute Inorganic Chemistry, Siberian Branch Russian Academy Sciences, Novosibirsk, 630090, Russia). Proceedings - Electrochemical Society, 97-25(Chemical Vapor Deposition), 1451-1458 (English) **1997**
. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.
AB The results of employment of new volatile complex compds. for synthesis of ZnxEu1-xS (0<x<1) films by CVD method are reported. The Zn and Eu compds. from the dithiocarbamate class were used. The spatial chem. homogeneity of the films was estd. by a new differential dissoln. method. Eu could be uniformly distributed over ZnS matrix up to concn. of 0.6 mol.%. This concn. is essentially higher than it is known for **crystals** (0.02 mol.%). When the concn. of Eu was >204 mol.%, the phase decompn. on noninteracting phases ZnS and EuS were obsd. However, when the concn. of Eu >95-97 mol.%, the dissoln. of Zn over EuS matrix was obsd.
IT **205235-84-3**, Europium zinc sulfide (Eu0-0.01Zn0.99-1S)
205235-85-4, Europium zinc sulfide (Eu0-0.02Zn0.98-1S)
205235-86-5, Europium zinc sulfide (Eu0.03Zn0.97S)

205235-87-6, Europium zinc sulfide (Eu0.13Zn0.87S)
205235-88-7, Europium zinc sulfide (Eu0.2Zn0.8S)
205235-89-8, Europium zinc sulfide (Eu0.36Zn0.64S)
205235-90-1, Europium zinc sulfide (Eu0.57Zn0.43S)
205235-91-2, Europium zinc sulfide (Eu0.85Zn0.15S)
(CVD and schematic diffractograms of films of)

RN 205235-84-3 HCA
CN Europium zinc sulfide (Eu0-0.01Zn0.99-1S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.99 - 1	7440-66-6
Eu	0 - 0.01	7440-53-1

RN 205235-85-4 HCA
CN Europium zinc sulfide (Eu0-0.02Zn0.98-1S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.98 - 1	7440-66-6
Eu	0 - 0.02	7440-53-1

RN 205235-86-5 HCA
CN Europium zinc sulfide (Eu0.03Zn0.97S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.97	7440-66-6
Eu	0.03	7440-53-1

RN 205235-87-6 HCA
CN Europium zinc sulfide (Eu0.13Zn0.87S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.87	7440-66-6
Eu	0.13	7440-53-1

RN 205235-88-7 HCA
CN Europium zinc sulfide (Eu0.2Zn0.8S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.8	7440-66-6
Eu	0.2	7440-53-1

RN 205235-89-8 HCA
CN Europium zinc sulfide (Eu0.36Zn0.64S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.64	7440-66-6
Eu	0.36	7440-53-1

RN 205235-90-1 HCA
CN Europium zinc sulfide (Eu0.57Zn0.43S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.43	7440-66-6
Eu	0.57	7440-53-1

RN 205235-91-2 HCA
CN Europium zinc sulfide (Eu0.85Zn0.15S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.15	7440-66-6
Eu	0.85	7440-53-1

IT **205235-82-1**, Europium zinc sulfide (Eu0-1Zn0-1S)
(phase states for Zn-Eu-S system thin films obtained by CVD method using zinc and europium dithiocarbamate deriv. complexes)
RN 205235-82-1 HCA
CN Europium zinc sulfide ((Eu,Zn)S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9

Zn	0 - 1	7440-66-6
Eu	0 - 1	7440-53-1

CC 75-1 (Crystallography and Liquid Crystals)
IT **205235-84-3**, Europium zinc sulfide (Eu0-0.01Zn0.99-1S)
205235-85-4, Europium zinc sulfide (Eu0-0.02Zn0.98-1S)
205235-86-5, Europium zinc sulfide (Eu0.03Zn0.97S)
205235-87-6, Europium zinc sulfide (Eu0.13Zn0.87S)
205235-88-7, Europium zinc sulfide (Eu0.2Zn0.8S)
205235-89-8, Europium zinc sulfide (Eu0.36Zn0.64S)
205235-90-1, Europium zinc sulfide (Eu0.57Zn0.43S)
205235-91-2, Europium zinc sulfide (Eu0.85Zn0.15S)
(CVD and schematic diffractograms of films of)
IT 60369-41-7 159161-56-5 **205235-82-1**, Europium zinc sulfide (Eu0-1Zn0-1S)
(phase states for Zn-Eu-S system thin films obtained by CVD method using zinc and europium dithiocarbamate deriv. complexes)

L53 ANSWER 13 OF 30 HCA
126:163977 Integration of thin-film **electroluminescent** device using hot electron injection into emitting layer on Si substrate. Nakanishi, Y.; Imada, T.; Sawada, K.; Mizuno, T.; Hatanaka, Y. (Research Institute Electronics, Shizuoka University, Hamamatsu, 432, Japan). Inorganic and Organic Electroluminescence, [International Workshop on Electroluminescence], 8th, Berlin, Aug. 13-15, 1996, 395-398. Editor(s): Mauch, Reiner H.; Gumlich, Hans-Eckhart. Wissenschaft und Technik: Berlin, Germany. (English) **1996.** CODEN: 63OXAW.
AB It is known that hot electrons that excite **luminescent** centers can be injected into an emitting layer from p-Si as a result of a band bending in Si at the **interface** between SiO2 and p-Si. Therefore, low voltage driving of an **EL** device is expected. A thin-film **EL** device was prepd. on p-MOSFET to apply the above principle. **Luminance** of .apprx.10 cd/m2 was obtained from ITO/**ZnS**:**Tb**/SiO2/p-n Si/Al device structure, and lowering of the driving voltage of .apprx.30 V was accomplished.
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST LED zinc sulfide terbium electron injection; hot electron LED zinc sulfide terbium; **electroluminescence** device zinc sulfide terbium injection; silicon LED zinc sulfide terbium injection
IT Hot electrons
(injection; integration of thin-film terbium-doped zinc sulfide **electroluminescent** device using hot electron injection into emitting layer on silicon substrate)
IT **Electroluminescent** devices

MOSFET (transistors)
(integration of thin-film terbium-doped zinc sulfide **electroluminescent** device using hot electron injection into emitting layer on silicon substrate)

IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses 7631-86-9, Silica, uses 50926-11-9, ITO
(integration of thin-film terbium-doped zinc sulfide **electroluminescent** device using hot electron injection into emitting layer on silicon substrate)

IT 7440-27-9, Terbium, properties
(integration of thin-film terbium-doped zinc sulfide **electroluminescent** device using hot electron injection into emitting layer on silicon substrate)

IT 1314-98-3, Zinc sulfide (ZnS), properties
(integration of thin-film terbium-doped zinc sulfide **electroluminescent** device using hot electron injection into emitting layer on silicon substrate)

L53 ANSWER 14 OF 30 HCA COPYRIGHT 2007 ACS on STN

126:24690 **Electroluminescent** device with less shift of emitting threshold voltage. Mizutani, Koji; Katayama, Masayuki; Hatsutori, Tamotsu (Nippon Denso Co, Japan). Jpn. Kokai Tokkyo Koho JP 08250282 A **19960927** Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-49680 19950309.

AB In the device, including an emitting layer sandwiched by a pair of insulating layers and further by a pair of electrodes on an insulating substrate, where the material forming an emitting side was transparent, the emitting layer comprises a Group IIB-VIA compd. semiconductor matrix doped with Tb, O, and halogen satisfying halogen/Tb 0.05-0.5 (**at. ratio**, excluding 0.5). The device shows stable emitting characters.

IT **7440-27-9**, Terbium, uses
(dopant; **electroluminescent** device with less shift of emitting threshold voltage)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

IT **1314-98-3**, Zinc sulfide, uses
(emitting layer; **electroluminescent** device with less shift of emitting threshold voltage)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM H05B033-14
ICS C09K011-56
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST **electroluminescent** device emitting threshold voltage stability; terbium halogen doped **electroluminescent** device
IT **Electroluminescent** devices
(**electroluminescent** device with less shift of emitting threshold voltage)
IT Group IIB element chalcogenides
(emitting layer; **electroluminescent** device with less shift of emitting threshold voltage)
IT **7440-27-9**, Terbium, uses 7726-95-6, Bromine, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses 7782-50-5, Chlorine, uses
(dopant; **electroluminescent** device with less shift of emitting threshold voltage)
IT 1314-13-2, Zinc oxide, uses **1314-98-3**, Zinc sulfide, uses
(emitting layer; **electroluminescent** device with less shift of emitting threshold voltage)
IT 1314-61-0, Tantalum oxide
(insulating layer; **electroluminescent** device with less shift of emitting threshold voltage)
IT 52934-06-2, Gallium zinc oxide
(transparent electrode; **electroluminescent** device with less shift of emitting threshold voltage)

L53 ANSWER 15 OF 30 HCA COPYRIGHT 2007 ACS on STN
126:24283 Study of zinc sulfide thin film with XPS analysis method. Chen, Zhenxiang; Liu, Zhaohong; Liu, Ruitang; Wang, Yujiang; Qiu, Weibin (Dept. of Phys., Xiamen Univ., 361005, Peop. Rep. China). Guti Dianzixue Yanjiu Yu Jinzhan, 16(3), 297-301 (Chinese) **1996**. CODEN: GDYJE2. ISSN: 1000-3819. Publisher: Guti Dianzixue Yanjiu Yu Jinzhan Bianjibu.
AB The **interface** states in a ZnS:Cu,Cl,Er thin film and the longitudinal distribution of the activators doped in the film are investigated with XPS anal. method in this paper. It is considered that the surface structure states formed by oxygen absorption are the main cause of inducing **interface** states and energy levels of **interface** traps. The results are relevant to the **electroluminescent** excitation process of the thin film.
IT **1314-98-3**, Zinc sulfide, properties
(**electroluminescence** of doped zinc sulfide thin films with XPS anal. method)
RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S══Zn

IT **7440-53-1**, Europium, properties
(**electroluminescence** of zinc sulfide thin films doped with)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **electroluminescence** zinc sulfide XPS analysis
IT **Luminescence, electroluminescence**
(of doped zinc sulfide thin films with XPS anal. method)
IT **1314-98-3**, Zinc sulfide, properties
(**electroluminescence** of doped zinc sulfide thin films with XPS anal. method)
IT 7440-50-8, Copper, properties **7440-53-1**, Europium, properties 7782-50-5, Chlorine, properties
(**electroluminescence** of zinc sulfide thin films doped with)

L53 ANSWER 16 OF 30 HCA COPYRIGHT 2007 ACS on STN
120:176854 Growth of Y2O2S:Eu thin films by reactive magnetron sputtering and **electroluminescent** characteristics. Sowa, Kunihiro; Tanabe, Masami; Furukawa, Seigo; Nakanishi, Yoichiro; Hatanaka, Yoshinori (Dep. Electron., Nippondenso Tech. Coll., Takatana, 446, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 32(12A), 5601-2 (English) **1993.** CODEN: JAPNDE. ISSN: 0021-4922.
AB Y2O2S:Eu **phosphor** films were prepd. by reactive magnetron sputtering with a Y2O3:Eu target in a H2S and Ar mixed atm., and hot carrier injection-type **electroluminescent** devices with Y2O2S:Eu/**ZnS**/Y2O2S:**Eu** structure were fabricated. The crystal structure of Y2O2S:Eu films depends on the S concn. in the film. With increasing **at. ratios** of S/Y, the crystal phase is changed from cubic to hexagonal. **Luminescent** spectra from the films are dependent on the crystal structures.
IT **1314-98-3**, Zinc sulfide, uses
(**electroluminescent** devices with europium-doped yttrium oxide sulfide and)
RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-53-1**, Europium, uses
(**phosphor** of yttrium oxide sulfide doped with, growth of thin films of, by reactive magnetron sputtering)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST **electroluminescence** europium doped yttrium oxide sulfide; **luminescence** europium doped yttrium oxide sulfide; **phosphor** europium doped yttrium oxide sulfide
IT **Electroluminescent** devices
Phosphors
(europium-doped yttrium oxide sulfide, growth of thin films of, by reactive magnetron sputtering)
IT **Luminescence**
Luminescence, electro-
(of europium-doped yttrium oxide sulfide thin films)
IT **1314-98-3**, Zinc sulfide, uses
(**electroluminescent** devices with europium-doped yttrium oxide sulfide and)
IT 12340-04-4, Yttrium oxide sulfide (Y2O2S)
(**phosphor** of europium-doped, growth of thin films of, by reactive magnetron sputtering)
IT **7440-53-1**, Europium, uses
(**phosphor** of yttrium oxide sulfide doped with, growth of thin films of, by reactive magnetron sputtering)

L53 ANSWER 17 OF 30 HCA COPYRIGHT 2007 ACS on STN
119:12208 Stream suspensates for gold and base metal exploration in metavolcanic felsic rocks, eastern Piedmont, Georgia, USA. Siegel, F. R.; Roach, N. M.; Yang, Wen; Viterito, A. (Dep. Geol., George Washington Univ., Washington, DC, 20052, USA). Journal of Geochemical Exploration, 47(1-3), 235-49 (English) **1993.**
CODEN: JGCEAT. ISSN: 0375-6742.
AB Suspended sediment geochem. in the drainage near the Magruder mines, in the easternmost Piedmont, Georgia, targeted Au and base metal mineralization. The mineralization is in a metadacite sequence and is comprised of quartz vein- hosted Au plus the primary minerals

chalcopyrite, sphalerite, galena and pyrite. In addn. to quartz, the gangue minerals include sericite and chlorite but gahnite and barite are common. The suspended sediments were analyzed for 24 elements by instrumental neutron activation anal. and for Cu and Pb by at. absorption spectrometry. Of the elements analyzed, Au, Cu, Zn and Ba are strong indicators of the mineralization but Pb and the rare earth elements (REE) also contribute to the multielement anomalies. The order of downstream dispersion of the elements from the Magruder mineralization is Au < Pb = Ba < Cu = Eu, Yb, Lu < Zn. The strongest Au value in the suspended sediment (1290 ppb) is located at the first sample site downstream (150-200 m) from the mineralized area. The max. downstream dispersion of strong concns. of an indicator element (Zn, 2300 ppm) extends to about 800 m from the mine area. Suspended sediment should be included as a sampling medium in geochem. exploration for quartz-vein hosted **fine -grained** (micron) Au and polymetallic sulfide deposits in felsic metavolcanic rocks in geomorphol. and climatol. regimes similar to that at the Magruder mines. Suspended sediments may be useful in delimiting areas with saprolite (eluvial) Au deposits and stream reaches with potential for the accumulation of very **fine-grained** (micron) Au in placer deposits.

IT **12169-28-7**, Sphalerite
(in metadacite, gold ore mineralization in relation to, of Magruder Mine, Piedmont, Georgia, USA)

RN 12169-28-7 HCA

CN Sphalerite (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, occurrence **7440-53-1**, Europium, occurrence
(in stream sediment suspensates, ore prospecting in relation to, of Magruder Mine, Piedmont, Georgia, USA)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

CC 53-2 (Mineralogical and Geological Chemistry)

IT 1302-75-6, Gahnite 1308-56-1, Chalcopyrite, occurrence

1309-36-0, Pyrite, occurrence **12169-28-7**, Sphalerite
12174-53-7, Sericite 12179-39-4, Galena 13462-86-7, Barite
14808-60-7, Quartz, occurrence
(in metadacite, gold ore mineralization in relation to, of
Magruder Mine, Piedmont, Georgia, USA)

IT 7439-91-0, Lanthanum, occurrence 7439-92-1, Lead, occurrence
7439-94-3, Lutetium, occurrence 7440-00-8, Neodymium, occurrence
7440-19-9, Samarium, occurrence 7440-20-2, Scandium, occurrence
7440-23-5, Sodium, occurrence **7440-27-9**, Terbium,
occurrence 7440-29-1, Thorium, occurrence 7440-36-0, Antimony,
occurrence 7440-38-2, Arsenic, occurrence 7440-39-3, Barium,
occurrence 7440-45-1, Cerium, occurrence 7440-46-2, Cesium,
occurrence 7440-47-3, Chromium, occurrence 7440-48-4, Cobalt,
occurrence 7440-50-8, Copper, occurrence **7440-53-1**,
Europium, occurrence 7440-57-5, Gold, occurrence 7440-58-6,
Hafnium, occurrence 7440-61-1, Uranium, occurrence 7440-64-4,
Ytterbium, occurrence 7440-66-6, Zinc, occurrence 7726-95-6,
Bromine, occurrence
(in stream sediment suspensates, ore prospecting in relation to,
of Magruder Mine, Piedmont, Georgia, USA)

L53 ANSWER 18 OF 30 HCA COPYRIGHT 2007 ACS on STN

111:183888 Zinc sulfide thin-film **electroluminescent** devices.
Mikami, Akyoshi; Ogura, Takashi; Taniguchi, Koji; Yoshida, Masaru
(Sharp Corp., Japan). Jpn. Kokai Tokkyo Koho JP 01103692 A
19890420 Heisei, 3 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1988-169217 19880707. PRIORITY: JP 1987-170314
19870708.

AB A thin-film **electroluminescent** device, suited for use as a
panel display, comprises rare earth element-activated Zn sulfide
having a S to Zn **at. ratio** of 1.02 to 1.13.

IT **123213-01-4**, Zinc sulfide (ZnS1.02-1.13)
(thin-film **electroluminescent** panel displays contg.
rare earth-activated)

RN 123213-01-4 HCA

CN Zinc sulfide (ZnS1.02-1.13) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1.02 - 1.13	7704-34-9
Zn	1	7440-66-6

IT **7440-27-9**, Terbium, uses and miscellaneous
(zinc sulfide activated by sulfur and, thin-film
electroluminescent devices contg.)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

IC ICM C09K011-00
ICS H05B033-14
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
ST thin film **electroluminescent** device panel; **electroluminescent** display zinc sulfide; zinc sulfide **electroluminescent** device
IT **Electroluminescent** devices
(zinc sulfide-based, thin film panel displays)
IT **123213-01-4**, Zinc sulfide (ZnS1.02-1.13)
(thin-film **electroluminescent** panel displays contg. rare earth-activated)
IT **7440-27-9**, Terbium, uses and miscellaneous
(zinc sulfide activated by sulfur and, thin-film **electroluminescent** devices contg.)
IT 7704-34-9, Sulfur, uses and miscellaneous
(zinc sulfide activated by terbium and, thin-film **electroluminescent** devices contg.)

L53 ANSWER 19 OF 30 HCA COPYRIGHT 2007 ACS on STN
111:87739 X-ray characterization of precipitates in europium-doped mercury telluride and zinc sulfide **crystals.** Jasiolek, Gabriel; Golacki, Zbigniew; Godlewski, Marek (Inst. Phys., Pol. Acad. Sci., Warsaw, 02-668, Pol.). Journal of Physics and Chemistry of Solids, 50(3), 277-82 (English) **1989.** CODEN: JPCSAW. ISSN: 0022-3697.
AB Quant. anal. on HgTe and ZnS **crystals** doped with Eu was carried out using an electron probe microanalyzer. The anal. revealed the presence of ppts. enriched in Eu. Concn. of the dopant element in the HgTe **crystal** was equal to 0.46 and 0.57 wt.% for the ZnS **crystal.** The ppts. which occurred in the Eu-doped HgTe **crystal** were identified as the Eu4Te7 phase while the ones found in the Eu-doped HgTe **crystal** were a mixt. of ZnEu2S4 and ZnS. The presence of trivalent Eu in the ppts. was confirmed by x-ray emission spectroscopic studies.
IT **122014-60-2**, Europium zinc sulfide (Eu2ZnS4)
(ppt. of, in europium-doped zinc sulfide, x-ray study of)
RN 122014-60-2 HCA
CN Europium zinc sulfide (Eu2ZnS4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

S	4	7704-34-9
Zn	1	7440-66-6
Eu	2	7440-53-1

CC 75-3 (Crystallography and Liquid Crystals)
IT **122014-60-2**, Europium zinc sulfide (Eu2ZnS4)
(ppt. of, in europium-doped zinc sulfide, x-ray study of)

L53 ANSWER 20 OF 30 HCA COPYRIGHT 2007 ACS on STN
110:125019 Fabrication of thin-film **electroluminescent** devices. Watanabe, Kazuhiro; Okamoto, Kenji; Yoshimi, Takuya; Sato, Kiyotake (Research Development Corp. of Japan, Japan; Fujitsu Ltd.). Jpn. Kokai Tokkyo Koho JP 63230871 A **19880927** Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-67166 19870319.
AB A process for making a thin-film **electroluminescent** device, by sputtering using a 1st target consisting of a halide of rare earth elements and a 2nd target consisting of a sulfide of Group IIB elements, comprises the steps of: contacting the 1st target with a sulfide gas, thereby converting the target into a 3rd target contg. the rare earth element, halogen, and S in the **at. ratio** 1:1:1 at least in the surface layer; and sputtering the converted 3rd target and the 2nd target in an inert gas, thereby forming an **electroluminescent** film.
IT **7440-27-9**, Terbium, uses and miscellaneous
(dopant, in zinc sulfide **electroluminescent** device)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

IT **1314-98-3**, Zinc sulfide, uses and miscellaneous
(thin-film **electroluminescent** device, fabrication of)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM C23C014-34
ICS H05B033-00
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST thin film **electroluminescent** device fabrication
IT Sputtering
(in thin-film **electroluminescent** device manuf.)
IT **Electroluminescent** devices

(thin-film sulfide, fabrication of)

IT **7440-27-9**, Terbium, uses and miscellaneous 7782-41-4, Fluorine, uses and miscellaneous
(dopant, in zinc sulfide **electroluminescent** device)

IT **1314-98-3**, Zinc sulfide, uses and miscellaneous
(thin-film **electroluminescent** device, fabrication of)

L53 ANSWER 21 OF 30 HCA COPYRIGHT 2007 ACS on STN

109:180053 Ultrafine grain fluorescent materials for **electroluminescent** devices. Tsukada, Katsura (Research Development Corp. of Japan, Japan; Stanley Electric Co., Ltd.). Eur. Pat. Appl. EP 258908 A2 **19880309**, 7 pp. DESIGNATED STATES: R: DE, FR, GB, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1987-112992 19870904. PRIORITY: JP 1986-210473 19860905.

AB The title materials comprise grains of a **luminescent** material (which incorporates an activator) which support a surface layer of a 2nd material selected to form a p-n junction or heterojunction at the **interface** between the materials. The **luminescent** material and the 2nd material may be semiconductors of opposite cond. types. Alternately, the **luminescent** material may be selected from ZnS, SrS, CaS, Y_2O_2S, $ZnSiO_4$, and ZnO with an activator selected from Cu, Cl, I, Al, Mn, and Eu; the 2nd material may be a layer of an oxide, nitride, sulfide, chloride, fluoride, bromide, iodide, sulfoxide, selenide, telluride, phosphide, or cyanide formed by treating the **luminescent** material.

IT **7440-53-1**, Europium, uses and miscellaneous
(**phosphors** activated with, **electroluminescent**
, semiconductor junction formation in relation to)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide (ZnS), uses and miscellaneous
(**phosphors** based on coated, **electroluminescent**
, semiconductor junction formation in prepn. of)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IC ICM C09K011-00
ICS C09K011-08; H05B033-14

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related

Properties)

ST **luminescent** material semiconductor junction; p n junction **electroluminescent** material; heterojunction **electroluminescent** material; semiconductor junction **electroluminescent** material

IT Bromides, uses and miscellaneous
Chlorides, uses and miscellaneous
Cyanides, uses and miscellaneous
Fluorides, uses and miscellaneous
Iodides, uses and miscellaneous
Nitrides
Oxides, uses and miscellaneous
Phosphides
Selenides
Sulfides, uses and miscellaneous
Sulfoxides
Tellurides
(in semiconductor junction formation for **electroluminescent phosphors**)

IT Semiconductor materials
(**phosphors** based on, **electroluminescent**)

IT Semiconductor junctions
(prepn. of, in **electroluminescent phosphor** prepn.)

IT **Phosphors**
(**electroluminescent**, semiconductor junction formation in prepn. of)

IT 7429-90-5, Aluminum, uses and miscellaneous 7439-96-5, Manganese, uses and miscellaneous 7440-50-8, Copper, uses and miscellaneous **7440-53-1**, Europium, uses and miscellaneous 7553-56-2, Iodine, uses and miscellaneous 7782-50-5, Chlorine, uses and miscellaneous
(**phosphors** activated with, **electroluminescent**, semiconductor junction formation in relation to)

IT 1314-13-2, Zinc oxide (ZnO), uses and miscellaneous 1314-96-1, Strontium sulfide **1314-98-3**, Zinc sulfide (ZnS), uses and miscellaneous 12340-04-4, Yttrium oxysulfide (Y2O2S) 13814-85-2, Zinc silicate 20548-54-3, Calcium sulfide
(**phosphors** based on coated, **electroluminescent**, semiconductor junction formation in prepn. of)

L53 ANSWER 22 OF 30 HCA COPYRIGHT 2007 ACS on STN
108:176857 Thin-film **electroluminescent** devices. Ogura, Takashi; Tanaka, Koichi; Taniguchi, Koji; Yoshida, Masaru; Mikami, Akiyoshi (Sharp Corp., Japan). U.S. US 4707419 A **19871117**, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1986-867814 19860527. PRIORITY: JP 1985-116071 19850528; JP 1985-240163 19851024.

AB The title devices have **light-emitting** layers comprising a host material (e.g., ZnS, ZnSe, CaS, or CdS) contg. F and rare earth element atoms (e.g., Tb, Sm, Tm, or Pr) in an **at. ratio** (F/rare earth elements) of 0.5-2.5. A sputtering target was prepd. from ZnS and TbF_3 and used to form a **light-emitting** layer for an **electroluminescent** device. The layer was annealed to adjust the F/Tb **at. ratio**, and insulating and electrode layers were formed to produce a green-emitting **electroluminescent** device.

IT **1314-98-3**, Zinc sulfide, uses and miscellaneous
(**electroluminescent** devices with **light-emitting** layers from fluorine- and rare earth element-contg.)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-27-9**, Terbium, uses and miscellaneous
(**electroluminescent** devices with **light-emitting** layers from hosts contg. fluorine and)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

IC ICM B32B009-04
ICS B32B017-06

INCL 428690000

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST rare earth fluorine ratio **electroluminescence**; terbium fluorine ratio **electroluminescence**; samarium fluorine ratio **electroluminescence**; thulium fluorine ratio **electroluminescence**; praseodymium fluorine ratio **electroluminescence**

IT Rare earth metals, uses and miscellaneous
(**electroluminescent** devices with **light-emitting** layers from hosts contg. fluorine and)

IT **Electroluminescent** devices
(**light-emitting** layers contg. fluorine and rare earth elements for, fluorine to rare earth element ratio in relation to)

IT 1306-23-6, Cadmium sulfide, uses and miscellaneous **1314-98-3**, Zinc sulfide, uses and miscellaneous 1315-09-9, Zinc selenide

(**electroluminescent** devices with **light-emitting** layers from fluorine- and rare earth element-contg.)

IT 20548-54-3, Calcium sulfide
(**electroluminescent** devices with **light-emitting** layers from fluorine- and rare earth element-contg.)

IT 7440-10-0, Praseodymium, uses and miscellaneous 7440-19-9, Samarium, uses and miscellaneous **7440-27-9**, Terbium, uses and miscellaneous 7440-30-4, Thulium, uses and miscellaneous
(**electroluminescent** devices with **light-emitting** layers from hosts contg. fluorine and)

IT 7782-41-4, Fluorine, uses and miscellaneous
(**electroluminescent** devices with **light-emitting** layers from hosts contg. rare earth elements and)

IT 13708-63-9P, Terbium fluoride (TbF3)
(**electroluminescent** devices with **light-emitting** layers prepd. from films doped with)

L53 ANSWER 23 OF 30 HCA

107:180437 Volcanic history, mineralization, and alteration of the Crandon massive sulfide deposit, Wisconsin. Lambe, Robert N.; Rowe, Roger G. (Exxon Co., Houston, TX, 77046, USA). Economic Geology and the Bulletin of the Society of Economic Geologists, 82(5), 1204-38 (English) **1987.** CODEN: ECGLAL. ISSN: 0361-0128.

AB The Early Proterozoic Crandon massive sulfide deposit occurs in a greenstone belt along the southern margin of the Canadian Shield and is conformably contained within a sequence of subaq. andesitic to dacitic pyroclastics, flows, and assocd. chem. sedimentary rocks. Regional metamorphism in the area achieved lower greenschist facies. The breccias overlying the footwall served as permeable conduits for the ore fluids, directing them laterally toward a syndepositional graben where the fluids were vented into a topog. depression on the ocean floor during a hiatus in local volcanic activity. Up to 100 m of massive sulfide consisting of laminae of pyrite and sphalerite with minor chalcopyrite, galena, quartz, chlorite, sericite, and dolomite and minor interbedded tuff, chert, argillite, sandy tuff, and dolomite were deposited. Following chem. sedimentation, hydrothermal venting continued, producing crosscutting vein mineralization. Ascending fluids continued to migrate laterally through the permeable breccia and deposited vein mineralization which plugged the original vent areas with **fine-grained** ppts. of SiO2 and sulfide. Vein mineralization in the footwall exhibits a systematic compositional variation with time and space from west to east. Beneath the west end of the deposit the earliest veins consist of quartz and grade eastward into quartz-chalcopyrite-pyrite, quartz-pyrite-sphalerite-chalcopyrite,

pyrite-sphalerite, and finally pyrite veins. Recoverable reserves in the deposit are .apprx.61 + 106 metric tons averaging Cu 1.1, Zn 5.6, Pb 0.5%, Ag 37, and Au 1.0 g/metric ton. Alteration of the footwall rocks at Crandon consists primarily of silicification, sericitization, pyritization, and minor chloritization. Interaction of ore fluid with wall rock resulted in enrichment in SiO2, Fe, K, F, S, Cu, Zn, As, Sb, Ba, Au, Hg, Pb, Bi, Se, and Cd and depletion in Al, Mg, Ca, Na, V, and Sr.

IT **12169-28-7**, Sphalerite
(compn. of, in massive sulfide ores, of Crandon, Wisconsin)

RN 12169-28-7 HCA

CN Sphalerite (ZnS) (9CI) (CA INDEX NAME)

S══Zn

IT **7440-53-1**, occurrence
(in volcanic rocks, of Early Proterozoic greenstone belt, of Crandon sulfide ore deposit, Wisconsin)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

CC 53-2 (Mineralogical and Geological Chemistry)

IT 1303-18-0, Arsenopyrite 1308-56-1, Chalcopyrite, properties 1309-36-0, Pyrite, properties **12169-28-7**, Sphalerite 12179-39-4, Galena 66844-41-5, Electrum
(compn. of, in massive sulfide ores, of Crandon, Wisconsin)

IT 7439-91-0, occurrence 7439-92-1, occurrence 7439-94-3, occurrence 7439-97-6, occurrence 7440-02-0, occurrence 7440-17-7, occurrence 7440-19-9, occurrence 7440-20-2, occurrence 7440-24-6, occurrence 7440-36-0, occurrence 7440-38-2, occurrence 7440-39-3, occurrence 7440-47-3, occurrence 7440-48-4, occurrence 7440-50-8, occurrence **7440-53-1**, occurrence 7440-55-3, occurrence 7440-57-5, occurrence 7440-62-2, occurrence 7440-65-5, occurrence 7440-66-6, occurrence 7440-67-7, occurrence 7440-69-9, occurrence 7704-34-9, occurrence 7782-41-4, occurrence
(in volcanic rocks, of Early Proterozoic greenstone belt, of Crandon sulfide ore deposit, Wisconsin)

L53 ANSWER 24 OF 30 HCA

107:86491 Difference in **electroluminescent** terbium,fluorine-doped zinc sulfide thin films prepared by electron-beam evaporation and RF magnetron sputtering. Mita, Juro; Koizumi, Masumi; Kanno, Hiromasa; Hayashi, Tadashi; Sekido,

Yoshihiro; Abiko, Ichimatsu; Nihei, Kohji (Res. Lab., Oki Electr. Ind. Co., Ltd., Tokyo, 193, Japan). Japanese Journal of Applied Physics, Part 2: Letters, 26(7), L1205-L1207 (English) **1987** . CODEN: JAPLD8.

AB To clarify the difference in **ZnS:Tb**,F films fabricated by electron-beam evapn. (EB) and by radio-frequency magnetron sputtering (SP), the doping condition of Tb and F ions was investigated by electron probe microanal. and secondary ion mass spectroscopy. The F/Tb **at. ratio** of 3 and **EL** spectra for EB films are hardly affected by annealing. As the model for the **luminescent** centers, it is proposed that the Tb and F ions are substituted for Zn and three S ion sites, resp., with 2 Zn vacancies for satisfying charge compensation. For the SP films, interstitial F ions are released from **ZnS** film and **Tb**-F complex centers are formed by annealing.

IT **1314-98-3**, Zinc sulfide, uses and miscellaneous
(**electroluminescence** of fluorine-terbium-doped, prepn. conditions effect on)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, uses and miscellaneous
(**electroluminescence** of zinc sulfide doped with fluorine and, prepn. conditions effect on)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **electroluminescence** zinc sulfide fluorine terbium; **luminescence electro** zinc sulfide fluorine terbium; electron beam evapn **electroluminescent** film; magnetron sputtering **electroluminescent** film

IT **Luminescence, electro-**
(of fluorine-terbium-doped zinc sulfide, prepn. conditions effect on)

IT **1314-98-3**, Zinc sulfide, uses and miscellaneous
(**electroluminescence** of fluorine-terbium-doped, prepn. conditions effect on)

IT **7440-27-9**, Terbium, uses and miscellaneous
(**electroluminescence** of zinc sulfide doped with fluorine and, prepn. conditions effect on)

IT 14762-94-8, Fluorine atom, uses and miscellaneous
(**electroluminescence** of zinc sulfide doped with terbium and, prepn. conditions effect on)

L53 ANSWER 25 OF 30 HCA COPYRIGHT 2007 ACS on STN
107:48698 Effects of annealing on terbium, fluorine-doped zinc sulfide **electroluminescent** thin films prepared by rf magnetron sputtering. Mita, Juro; Koizumi, Masumi; Kanno, Hiromasa; Hayashi, Tadashi; Sekido, Yoshihiro; Abiko, Ichimatsu; Nihei, Kohji (Res. Lab., Oki Electr. Ind. Co., Ltd., Hachiohji, 193, Japan). Japanese Journal of Applied Physics, Part 2: Letters, 26(5), L558-L560 (English) **1987.** CODEN: JAPLD8.
AB The effects of annealing on sputtered **ZnS:Tb**, F thin films is investigated by electron probe microanal., SIMS, and XPS. The annealing decreases the F/Tb **at. ratio** from 4 to 1, due to the release of F atoms. Many of the F- not contributing to the formation of **luminescent** centers with Tb3+ exist in as-sputtered film, and efficient Tb-F complex centers are formed by annealing at >400°. **Luminance** was enhanced by increasing the Tb-F complex centers and decreasing the hot-electron scattering centers of the F-.
IT **1314-98-3**, Zinc monosulfide, uses and miscellaneous
(fluoride- and terbium trication-doped **electroluminescent** thin films of, annealing effect on)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, properties
(spectral lines of, in XPS of fluoride- and terbium trication-doped zinc sulfide **electroluminescent** thin films)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST **electroluminescence** terbium fluoride zinc sulfide; **luminescence** terbium fluoride zinc sulfide
IT **Electroluminescent** devices
(fluoride- and terbium trication-doped zinc sulfide, annealing effects on)

IT Mass spectra
  (secondary-ion, of fluoride- and terbium trication-doped zinc sulfide **electroluminescent** thin films)
IT Photoelectric emission
  (x-ray, of fluoride- and terbium trication-doped zinc sulfide **electroluminescent** thin films)
IT **1314-98-3**, Zinc monosulfide, uses and miscellaneous
  (fluoride- and terbium trication-doped **electroluminescent** thin films of, annealing effect on)
IT **7440-27-9**, Terbium, properties 7782-41-4, Fluorine, properties
  (spectral lines of, in XPS of fluoride- and terbium trication-doped zinc sulfide **electroluminescent** thin films)
IT 13708-63-9, Terbium trifluoride 16984-48-8, Fluoride, uses and miscellaneous 22541-20-4, Terbium(3+), uses and miscellaneous
  (zinc monosulfide **electroluminescent** thin films contg., annealing effect on)

L53 ANSWER 26 OF 30 HCA COPYRIGHT 2007 ACS on STN
98:98280 Effect of electric field and polarity on **light emission** in metal-insulator-semiconductor structure thin-film **electroluminescent** devices. Ohwaki, Jun-ichi; Kozawaguchi, Haruki; Tsujiyama, Bunjiro (Elec. Commun. Lab., Nippon Telegr. and Teleph. Public Corp., Tokai, 319-11, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 22(1), 65-7 (English) **1983.** CODEN: JAPNDE.
AB Changes in the emission intensities and spectra with applied elec. fields in metal-insulator-semiconductor (MIS) structure thin-film **electroluminescent** (TFEL) devices was investigated by using devices with stacked emitting layer structures, such as ITO/**ZnS**:Mn/**ZnS**:**Tb**/Sm2O3/Al. In MIS-TFEL devices, the emission distribution in the direction of the ZnS film thickness is nonhomogeneous. In particular, the emission intensity in the region near the ZnS-insulator **interface** increases with increasing applied voltage more than in the other region in the ZnS layer, when electrons exciting emission centers are accelerated from the insulator side. The emission is homogeneous at the opposite polarity. The emission color for stacked emitting layer MIS-TFEL devices can be modulated by changing the applied voltage.
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
  Section cross-reference(s): 76
ST **electroluminescent** device emission polarity effect
IT **Electroluminescent** devices
  (elec. field and polarity effect on emission characteristics of MIS)
IT **Luminescence, electro-**

(of MIS thin-film structures, effect of polarity and applied elec. field on)

IT 1312-43-2 1314-98-3, uses and miscellaneous 7429-90-5, uses and miscellaneous 7439-96-5, uses and miscellaneous 7440-27-9, uses and miscellaneous 12060-58-1
(**electroluminescent** device contg., elec. field and polarity effect on emission characteristics of MIS)

L53 ANSWER 27 OF 30 HCA COPYRIGHT 2007 ACS on STN
85:101014 Intensifying screen for radiography. Shimiya, Keiji; Hiratsuka, Miura (Dai Nippon Toryo Co., Ltd., Japan). Ger. Offen. DE 2534105 **19760708**, 30 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1975-2534105 19750730.

AB An intensifying screen for radiog. is described which consists of a substrate with a fluorescent layer applied to it. The fluorescent layer has grains of a fluorescing substrate dispersed in it, in such a way that the grain size gradually becomes smaller from one surface of the fluorescent layer (on the side which is exposed to the **light emitted** from the fluorescent substance) to its other surface on the substrate side. A transparent protective layer is formed on the fluorescent layer, and the fluorescent substance is chosen from a group consisting of self-activated $CaWO_4$, Pb-activated $BaSO_4$, Ag-activated **ZnS**, **Tb**-activated Gd oxysulfide, Tb-activated La oxysulfide, and Tb-activated Y oxysulfide. The av. grain size of the fluorescent substance is 1.5-15 μm. The fluorescent substance is dispersed in a resin-like binding material (of the fluorescent layer), chosen from the group consisting of nitrocellulose, poly(Me methacrylate), vinyl chloride-vinyl acetate copolymer, and polyvinylbutyral. The fluorescent layer also contains **fine grains** of a white pigment, the av. grain size of which is much smaller than the grains of the fluorescent substance. For example, self-activated $CaWO_4$ [7790-75-2] of av. grain size 5 μm was used as the fluorescent substance. Sepd. (according to grain size) portions of the material were then dispersed in a soln. of cellulose nitrate [9004-70-0] as binding material in a solvent mixt. of EtOA 1, BuOAc 8, and acetone 1 part at a residual resin/fluorescent substance ratio of 1:8. Then, the viscosity of each dispersion was adjusted to 50 cSt. The dispersions were then applied one after the other in the previously prescribed manner to a resin-coated, wood-free paper (with drying occurring between each coating). Finally, a protective layer was applied on the fluorescent layer from a soln. of cellulose nitrate in a solvent mixt. contg. acetone 7, EtOH 2, amyl alc. 1 part, to a thickness of 10 μm.

IC G03C001-92

CC 71-9 (Nuclear Technology)
Section cross-reference(s): 73

L53 ANSWER 28 OF 30 HCA COPYRIGHT 2007 ACS on STN
83:68410 Energetics yield of radical **luminescence** of sulfide
luminophors. Krongauz, V. G.; Dmitriev, B. P. (USSR).
Sbornik Nauchnykh Trudov - Vsesoyuznyi Nauchno-Issledovatel'skii
Institut Lyuminoforov i Osobo Chistykh Veshchestv, 9, 54-8 (Russian)
1973. CODEN: SNVNAR. ISSN: 0371-1722.

AB The dependence of the radical **luminescence** energy output
on the matrix compn. and activator was studied in sulfide
luminophors. The energy output reaches its max. with a
definite Zn:Cd **ratio** in an **at.** H atm., while in
at. N it decreases continuously with Cd content. The adsorption and
recombination processes take place mainly in the activator surface
centers. The **luminiscence** efficiency is considerably
dependent on resonance transfer of recombination energy to the
activator centers.

IT **1314-98-3**, properties
(radical **luminescence** in doped, treated by at. hydrogen
or nitrogen)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **1314-98-3D**, Zinc sulfide, solid solns. with cadmium sulfide
(radical **luminescence** in doped, treated in presence of
hydrogen or nitrogen)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-27-9**, properties
(radical **luminescence** of zinc sulfide doped with,
treated by at. hydrogen or nitrogen)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

CC 73-3 (Spectra by Absorption, Emission, Reflection, or Magnetic
Resonance, and Other Optical Properties)
ST radical **luminescence** sulfide **phosphor**
IT Radicals, properties
(**luminescence** of, on zinc cadmium sulfide
phosphors exposed to hydrogen or nitrogen atm.)

IT **Luminescence**
(radical, in cadmium zinc sulfide **phosphors** contg. metal dopants treated in presence of hydrogen or nitrogen atm.)
IT Energy transfer
(resonance, of recombination energy to activator centers in doped **phosphors**)
IT 12385-13-6, properties 17778-88-0, properties
(radical **luminescence** by cadmium zinc sulfide doped **phosphors** treated in presence of)
IT 1306-23-6, properties **1314-98-3**, properties
(radical **luminescence** in doped, treated by at. hydrogen or nitrogen)
IT 1306-23-6D, Cadmium sulfide, solid solns. with zinc sulfide
1314-98-3D, Zinc sulfide, solid solns. with cadmium sulfide
(radical **luminescence** in doped, treated in presence of hydrogen or nitrogen)
IT 7440-22-4, properties 7440-50-8, properties
(radical **luminescence** of cadmium zinc sulfide **phosphors** doped with, treated in presence of hydrogen or nitrogen atm.)
IT 7440-00-8, properties 7440-19-9, properties **7440-27-9**, properties 7440-30-4, properties 7440-52-0, properties 7440-54-2, properties 7440-60-0, properties
(radical **luminescence** of zinc sulfide doped with, treated by at. hydrogen or nitrogen)

L53 ANSWER 29 OF 30 HCA COPYRIGHT 2007 ACS on STN
78:116111 Preparation and properties of II-Ln2-S4 ternary sulfides.
Yim, W. M.; Fan, A. K.; Stofko, E. J. (David Sarnoff Res. Cent., RCA Lab., Princeton, NJ, USA). Journal of the Electrochemical Society, 120(3), 441-6 (English) **1973.** CODEN: JESOAN. ISSN: 0013-4651.
AB The structure of the compds., if they were formed was investigated with x-ray diffraction techniques using primarily the materials synthesized in powder form. Single **crystals** were subsequently grown from the powder for several compds. including $ZnSc_2S_4$ and $CdSc_2S_4$ which were found to have bandgaps of 2.1 and2.3eV rep., at room temp. Doping with a variety of impurities provided conducting n-type specimens were also obtained. Weak cathodoluminescence was obsd. from several compds. including $CaCe_2S_4$ with a green-yellow and $ZnLu_2S_4$ with a blue-green emission color.
IT **39312-70-4P**
(prepn. of)
RN 39312-70-4 HCA
CN Terbium zinc sulfide (Tb_2ZnS_4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

S	4	7704-34-9
Zn	1	7440-66-6
Tb	2	7440-27-9

CC 70-1 (Crystallization and Crystal Structure)
Section cross-reference(s): 71, 73
ST growth rare earth ternary sulfide; **luminescence** rare earth ternary sulfide; structure rare earth ternary sulfide
IT **Luminescence**
(cathodo-, of rare earth ternary sulfides)
IT **Crystal** growth
Crystal structure
(of rare earth ternary sulfides)
IT 12014-01-6 12524-91-3 37235-67-9 37322-78-4 39311-98-3
39312-05-5
(**crystal** structure and cathodoluminescence of)
IT 37322-91-1 39312-01-1
(**crystal** structure and elec. conductivity of, contg. impurities)
IT 12014-18-5 12524-94-6 12524-98-0 12525-03-0 12525-07-4
12525-11-0 12525-12-1 12525-13-2 37235-66-8 37267-15-5
37322-92-2 39311-99-4 39312-71-5
(**crystal** structure of)
IT 12013-96-6P 12272-45-6P 39311-95-0P 39311-96-1P 39311-97-2P
39312-00-0P 39312-02-2P 39312-03-3P 39312-06-6P 39312-18-0P
39312-19-1P 39312-25-9P 39312-53-3P 39312-58-8P 39312-62-4P
39312-67-9P 39312-69-1P **39312-70-4P** 39312-72-6P
(prepn. of)

L53 ANSWER 30 OF 30 HCA COPYRIGHT 2007 ACS on STN
49:68067 Original Reference No. 49:12969c-f **Luminescence** studies on fluorite and other minerals. Haberlandt, V. Herbert (Univ. Vienna). Osterr. Akad. Wiss., Math.-naturw. Kl., Sitzber Abt. I, 163, 375-99 (Unavailable) **1954.**
AB cf. C.A. 45, 5025e. Bivalent Eu and Yb give characteristic fluorescence to fluorite samples when present in trace amts. Trivalent Eu can be identified with short wave length ultraviolet (2537 A.). Short wave length ultraviolet excitation also can be used to det. Eu in apatite whereas the longer wave length ultraviolet (3650 A.) induces fluorescence indicative of other rare earths. The characteristics of the fluorescence of apatite, aragonite, zircon, rock salt, and zinc blende are discussed.
IT **7440-53-1**, Europium
(compds., in minerals, fluorescence and)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT **12169-28-7, Sphalerite**
(fluorescence of)
RN 12169-28-7 HCA
CN Sphalerite (ZnS) (9CI) (CA INDEX NAME)

S═Zn

CC 3 (Electronic Phenomena and Spectra)
IT Fluorescence
Luminescence
(of fluorite and other minerals)
IT Polarization (of rays or waves)
(of **luminescence**, of Eu ions in CaF_2 crystal lattice)
IT **7440-53-1**, Europium 7440-64-4, Ytterbium
(compds., in minerals, fluorescence and)
IT **12169-28-7, Sphalerite** 14542-23-5, Fluorite
14762-51-7, Sodium chloride (NaCl), rock salt 14791-73-2,
Aragonite 14940-68-2, Zircon
(fluorescence of)

=> D L54 1-24 CBIB ABS HITSTR HITIND

L54 ANSWER 1 OF 24 HCA COPYRIGHT 2007 ACS on STN
143:140326 Nanoparticle thermometry and pressure sensors. Chen, Wei; Wang, Shaopeng; Westcott, Sarah (USA). U.S. Pat. Appl. Publ. US 2005169348 A1 20050804, 32 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-460531 20030612. PRIORITY: US 2002-388211P 20020612.

AB A nanoparticle fluorescence (or upconversion) sensor comprises an electromagnetic source, a sample, and a detector. The electromagnetic source emits an excitation. The sample is positioned within the excitation. At least a portion of the sample is assocd. with a sensory material. The sensory material receives at least a portion of the excitation emitted by the electromagnetic source. The sensory material has a plurality of **luminescent** nanoparticles **luminescing** upon receipt of the excitation with **luminance** emitted by the **luminescent** nanoparticles changing based on at least one of temp. and pressure. The detector receives at least a portion of the **luminance** emitted by the **luminescent** nanoparticles and outputs a **luminance** signal indicative of such **luminance.** The **luminescence** signal is correlated into a signal indicative of the atm. adjacent to the sensory material.

IT **7440-27-9**, Terbium, properties
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

IT **1314-98-3**, Zinc sulfide (ZnS), properties
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, properties
(nanoparticles doped with; nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IC ICM G01K011-00
ICS G01K013-00; G01K001-14
INCL 374161000; 374141000
CC 69-4 (Thermodynamics, Thermochemistry, and Thermal Properties)
Section cross-reference(s): 9, 47, 73
ST nanoparticle thermometry pressure sensor; electromagnetic source **luminescent** nanoparticle fluorescence sensor temp pressure
IT Energy level excitation
Fluorescence
Fluorescence up-conversion
Fluorescent substances
Nanocomposites
Nanoparticles
Pressure sensors
Semiconductor materials
Thermometry
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on

temp. or pressure)

IT Optical fibers
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure contained on or within)

IT Zeolites (synthetic), uses
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure contained on or within)

IT Human
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure for in vivo and in vitro studies of)

IT **Crystal** defects
Crystal vacancies
Interstitials
(**nanoparticle** thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence from)

IT Rare earth metals, properties
(nanoparticles doped with; nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

IT 1314-36-9, Yttrium oxide (Y2O3), uses 7758-23-8 7787-32-8, Barium fluoride (BaF2) 13597-65-4, Zinc silicate (Zn2SiO4) 13709-38-1, Lanthanum fluoride (LaF3) 13709-49-4, Yttrium fluoride (YF3) 21669-04-5, Barium bromide fluoride (BaBrF)
(insulator; nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

IT 39385-56-3D, Poly(phenyleneacetylene), sulfonated
(nanocomposite with manganese-doped zinc sulfide; nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

IT 7440-00-8, Neodymium, properties 7440-22-4, Silver, properties **7440-27-9**, Terbium, properties 7440-28-0, Thallium, properties 7440-45-1, Cerium, properties 7440-50-8, Copper, properties 7440-64-4, Ytterbium, properties
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

IT 1303-11-3, Indium arsenide (InAs), properties 1306-23-6, Cadmium sulfide (CdS), properties 1306-24-7, Cadmium selenide (CdSe), properties 1306-25-8, Cadmium telluride, properties 1314-13-2, Zinc oxide (ZnO), properties 1314-87-0, Lead sulfide (PbS) **1314-98-3**, Zinc sulfide (ZnS), properties 7774-29-0, Mercury iodide (HgI2) 10101-63-0, Lead iodide (PbI2) 12030-24-9, Indium sulfide (In2S3) 12032-36-9, Magnesium sulfide (MgS) 12069-00-0, Lead selenide (PbSe) 22398-80-7, Indium phosphide

(InP), properties
(nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

IT 7439-96-5, Manganese, properties **7440-53-1**, Europium, properties
(nanoparticles doped with; nanoparticle thermometry and pressure sensors based on **luminescent** nanoparticles with fluorescence dependent on temp. or pressure)

L54 ANSWER 2 OF 24 HCA

140:119675 Composite nanoparticle and process for producing the same. Isobe, Tetsuhiko; Hattori, Yasushi; Itoh, Shigeo; Takahashi, Hisamitsu (Futaba Corporation, Japan; Keio University). PCT Int. Appl. WO 2004007636 A1 20040122, 45 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2003-JP9032 20030716. PRIORITY: JP 2002-207287 20020716.

AB Composite nanoparticles which are **nanocrystal** particles independently dispersed stably in a suspension in a high concn. while being prevented from agglomerating. A given amt. of pure H2O or deionized H2O is introduced into a reaction vessel. N gas is passed through the vessel at a N flow rate of 300 cm3/min for a given period while stirring the contents with a stirrer to remove the O dissolved in the pure H2O. Thereafter, the H2O is allowed to stand in a N atm. Subsequently, while the N atm. inside the reaction vessel is maintained, Na citrate as a dispersion stabilizer, an aq. MPS soln. as a surfactant, and an aq. anion soln. and aq. cation soln. which are to be copptd. as **nanocrystals** are added in this order with stirring. Thereto is added an aq. Na silicate soln. The resultant mixt. is stirred and allowed to stand in the dark in the N atm. A vitrification inhibitor may be added to control the growth of a vitreous surface layer.

IT **7440-27-9P**, Terbium, uses **7440-53-1P**, Europium, uses
(composite nanoparticle)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3P**, Zinc sulfide, preparation
(composite nanoparticle)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IC ICM C09K011-08
ICS C09K011-56
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 78
ST composite nanoparticle prodn **phosphor** **electroluminescent** device
IT **Electroluminescent** devices
Nanocrystals
Nanoparticles
Phosphors
(composite nanoparticle)
IT 7429-91-6P, Dysprosium, uses 7439-92-1P, Lead, uses 7439-96-5P, Manganese, uses 7440-19-9P, Samarium, uses **7440-27-9P**, Terbium, uses 7440-30-4P, Thulium, uses 7440-36-0P, Antimony, uses 7440-45-1P, Cerium, uses 7440-50-8P, Copper, uses 7440-52-0P, Erbium, uses **7440-53-1P**, Europium, uses 7440-54-2P, Gadolinium, uses 7440-60-0P, Holmium, uses 7440-64-4P, Ytterbium, uses 7631-86-9P, Silica, uses
(composite nanoparticle)
IT 1314-96-1P, Strontium sulfide **1314-98-3P**, Zinc sulfide, preparation 12032-36-9P, Magnesium sulfide 12068-85-8P, Iron sulfide (fes2) 20548-54-3P, Calcium sulfide 21109-95-5P, Barium sulfide
(composite nanoparticle)

L54 ANSWER 3 OF 24 HCA
139:124826 **Electroluminescent** device having three-dimensional percolated layer. Perlo, Piero; Li Pira, Nello; Monferino, Rossella; Repetto, Piermario; Lambertini, Vito; Paderi, Marzia (C.R.F. Societa Consortile Per Azioni, Italy). PCT Int. Appl. WO 2003058728 A1 20030717, 22 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ,

DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-IB5543 20021218. PRIORITY: IT 2002-TO33 20020111.

AB An **electroluminescent** device is described comprising a glass or plastic supporting substrate; at least two electrodes (e.g., Cu, Ag, Au, Al, Pt, Ni) positioned on the substrate; at least a three-dimensional percolated layer positioned on the substrate between the electrodes, the three-dimensional percolated layer having a metallic mesoporous structure defining a multitude of cavities with micrometric or nanometric dimensions, the structure being in particular composed of metallic interconnections or metallic dielecs. interconnections connected so as to guarantee elec. conduction; a multitude of **luminescent** inclusions, in particular in the form of nanoparticles or macromols., housed in resp. cavities of the three-dimensional percolated layer, where the **luminescent** inclusions are operative to **emit light** when energized by electrons which, as a result of electron tunneling effect, pass through the three-dimensional percolated layer. The **luminescent** inclusion may be selected from semiconductor **nanocrystal**, metallic nanoparticles, Coumarin 7, Alq3, Spiro compds., **electroluminescent** polymers, Si, CdSe, CdTe, CdSe/ZnS, CdSe/CdS or metalorg. compds. of Eu, Tb, Er, and Yb.

IT **1314-98-3**, Zinc sulfide (ZnS), uses
(**luminescent** inclusion; **electroluminescent** device having three-dimensional percolated layer)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(metalorg. compd., **luminescent** inclusions; **electroluminescent** device having three-dimensional percolated layer)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IC ICM H01L049-02
ICS H05B033-12
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 41, 76
ST **electroluminescent** device three dimensional percolated cavity
IT **Electroluminescent** devices
(**electroluminescent** device having three-dimensional percolated layer)
IT **Nanocrystals**
(**luminescent** inclusions; **electroluminescent** device having three-dimensional percolated layer)
IT Polymers, uses
Spiro compounds
(**luminescent** inclusions; **electroluminescent** device having three-dimensional percolated layer)
IT Glass, uses
Plastics, uses
(substrate; **electroluminescent** device having three-dimensional percolated layer)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses
(electrode; **electroluminescent** device having three-dimensional percolated layer)
IT 1306-23-6, Cadmium sulfide (CdS), uses 1306-24-7, Cadmium selenide (CdSe), uses 1306-25-8, Cadmium telluride (CdTe), uses **1314-98-3**, Zinc sulfide (ZnS), uses 2085-33-8, Alq3 7440-21-3, Silicon, uses 27425-55-4, Coumarin 7
(**luminescent** inclusion; **electroluminescent** device having three-dimensional percolated layer)
IT **7440-27-9**, Terbium, uses 7440-52-0, Erbium, uses **7440-53-1**, Europium, uses 7440-64-4, Ytterbium, uses
(metalorg. compd., **luminescent** inclusions; **electroluminescent** device having three-dimensional percolated layer)

L54 ANSWER 4 OF 24 HCA COPYRIGHT 2007 ACS on STN
137:177228 Manufacture of **light emitter** having **nanocrystal** structure for display device. Ihara, Masaru; Kusunoki, Tsuneo; Ono, Katsutoshi (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002241929 A **20020828**, 9 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 2001-35315 20010213. PRIORITY: JP 2000-234911 20000802; JP 2000-295639 20000928; JP 2000-377685 20001212.

AB The process comprises the steps of (1) disposing a target material consisting of a **light-emitting** matrix and an activating agent in a vacuum chamber filled with a gas, (2) effecting a laser-induced ablation to melt and evap. the target material, (3) assocg. substances contained in the target material in the vacuum space for form an ultrafine particle, and (4) depositing the assocd. ultrafine particle on the substrate. The **light-emitting** matrix is selected from ZnS, GaN, GaP, and InP; and the activating agent is selected from Tb, Eu, Cu, Al, Ag, Cl, and Mn. A display device such as a FED and a PDP using the **light emitter** is also claimed.

IT **7440-27-9**, Terbium, processes **7440-53-1**, Europium, processes
(dopant; **light emitter** having **nanocrystal** structure for display device)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, processes
(manuf. of **light emitter** having **nanocrystal** structure for display device)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IC ICM C23C014-28
ICS C09K011-56; C09K011-62; G09F009-00; H01J011-02; H01J029-20; H01L021-363

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 75

ST **light emitter nanocrystal** structure laser induced ablation; field **emission** display **light emitter**; plasma display panel **light**

emitter; optical display **light emitter**; **phosphor** laser induced ablation **light emitter**

IT Field emission displays
Optical imaging devices
Plasma display panels
(manuf. of **light emitter** having **nanocrystal** structure for)

IT Laser ablation
Light sources
Nanocrystals
Phosphors
(manuf. of **light emitter** having **nanocrystal** structure for display device)

IT 7429-90-5, Aluminum, processes 7439-96-5, Manganese, processes 7440-22-4, Silver, processes **7440-27-9**, Terbium, processes 7440-50-8, Copper, processes **7440-53-1**, Europium, processes 22537-15-1, Chlorine atom, processes
(dopant; **light emitter** having **nanocrystal** structure for display device)

IT 1308-96-9, Europium oxide 7758-98-7, Copper sulfate, processes 7783-90-6, Silver chloride, processes 7785-87-7, Manganese sulfate 10043-01-3, Aluminum sulfate 12036-41-8, Terbium oxide
(dopant; manuf. of **light emitter** having **nanocrystal** structure for display device)

IT **1314-98-3**, Zinc sulfide, processes 12063-98-8, Gallium phosphide, processes 22398-80-7, Indium phosphide, processes 25617-97-4, Gallium nitride
(manuf. of **light emitter** having **nanocrystal** structure for display device)

L54 ANSWER 5 OF 24 HCA COPYRIGHT 2007 ACS on STN
137:53988 Photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepared in a water/methanol solution. Qu, S. C.; Zhou, W. H.; Liu, F. Q.; Chen, N. F.; Wang, Z. G.; Pan, H. Y.; Yu, D. P. (Institute of Semiconductors, Key Laboratory of Semiconductor Materials Science, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep. China). Applied Physics Letters, 80(19), 3605-3607 (English) **2002.** CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB Monodispersed ZnS and Eu3+-doped ZnS **nanocrystals** were prepd. through the co-pptn. reaction of inorg. precursors ZnCl2, EuCl3, and Na2S in a H2O/MeOH binary soln. The mean particle sizes are .apprx.3-5 nm. The structures of the as-prepd. ZnS nanoparticles are cubic (Zn blende) as demonstrated by an x-ray powder diffraction. Photoluminescence studies showed a stable room temp. emission in the visible spectrum region for all the samples, with a broadening in the emission band and, in particular, a

partially overlapped twin peak in the Eu3+-doped ZnS **nanocrystals.** The exptl. results also indicated that Eu3+-doped ZnS **nanocrystals**, prepd. by controlling synthetic conditions, were stable.

IT **7440-53-1**, Europium, properties
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, properties
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S══Zn

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **luminescence** europium doped zinc sulfide **nanocrystal** water methanol

IT **Luminescence**
Surface structure
X-ray diffraction
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

IT 67-56-1, Methanol, uses
(aq.; photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

IT 10025-76-0, Europium chloride
(europium source; photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

IT **7440-53-1**, Europium, properties 22541-18-0, Europium(3+), properties
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

IT **1314-98-3**, Zinc sulfide, properties
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

IT 1313-82-2, Sodium sulfide, reactions 7646-85-7, Zinc chloride, reactions
(photoluminescence properties of Eu3+-doped ZnS **nanocrystals** prepd. in a water/methanol soln.)

L54 ANSWER 6 OF 24 HCA COPYRIGHT 2007 ACS on STN
136:316415 Cathodoluminescence and photoluminescence of **nanocrystal phosphors.** Ihara, M.; Igarashi, T.; Kusunoki, T.; Ohno, K. (Sony Corporation, Atsugi, 243-0021, Japan). Journal of the Electrochemical Society, 149(3), H72-H75 (English) **2002.** CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB **Nanocrystals** of Tb- or Eu-doped ZnS were prepd. using a new technique yielding high **luminescent** efficiency. The photoluminescent intensities of **nanocrystal ZnS: Tb** and **ZnS:Eu** were about three times higher than those of bulk **phosphors.** These **nanocrystals** were coated by a glass ingredient. The cathodoluminescent efficiency was improved by contriving the synthesis of glass-ingredient-coated **nanocrystals.** The cathodoluminescent intensities of the **nanocrystals** were more than ten times higher than those of uncoated **nanocrystals.** While the compn. of uncoated **nanocrystal phosphor** changed by electron bombardment, the glass-ingredient-coated **nanocrystal phosphor** was protected from surface oxidn. Glass ingredient plays a role in the redn. of **phosphor** degrdn. by bombardment of electron-beams.

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(cathodoluminescence and photoluminescence of **nanocrystal phosphors**)

RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, properties
(cathodoluminescence and photoluminescence of **nanocrystal phosphors**)

RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST cathodoluminescence **luminescence nanocrystal phosphor**; terbium europium doped zinc sulfide **phosphor**
IT **Luminescence**
  Phosphors
  Surface structure
    (cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT Rare earth metals, uses
    (ions; cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT Oxidation
    (surface, effect of; cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
    (cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT **1314-98-3**, Zinc sulfide, properties
    (cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT 78-10-4, Silicon tetraethoxide 557-34-6, Zinc acetate 1313-82-2, Sodium sulfide, reactions
    (cathodoluminescence and photoluminescence of **nanocrystal phosphors**)
IT 10043-27-3, Terbium nitrate 10138-01-9, Europium nitrate
    (dopant source; cathodoluminescence and photoluminescence of **nanocrystal phosphors**)

L54 ANSWER 7 OF 24 HCA COPYRIGHT 2007 ACS on STN
135:233222 ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials. Yang, P.; Lu, M.; Xu, D.; Yuan, D.; Zhou, G. (State Key Laboratory of Crystal Material, Shandong University, Jinan, 250100, Peop. Rep. China). Journal of Luminescence, 93(2), 101-105 (English) **2001**. CODEN: JLUMA8. ISSN: 0022-2313. Publisher: Elsevier Science B.V..
AB The authors report on the unique **luminescent** properties of ZnS nanoparticles co-activated by Cu2+ and rare-earth metallic ions. The co-activated ZnS **nanocrystals** with varying sizes from 20 to 30 Å were prepd. by using a chem. copptn. at room temp. The nanoparticles can be co-doped with Cu and rare-earth metallic ions during synthesis without altering x-ray diffraction patterns. However, the doping shifts the **luminescence** to 540-550 nm. The fluorescence intensity of the co-activated ZnS nanoparticles is .apprx.10-15 times that of undoped ZnS nanoparticles. These novel properties may be attributed to the formation of composite

luminescent centers of Cu and rare-earth metallic ions.

IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystals**; ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S══Zn

IT **7440-27-9**, Terbium, properties
(zinc sulfide contg.; ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75, 78

ST zinc sulfide **nanocrystal** transition metal rare earth **luminescence** XRD; copper zinc sulfide **nanocrystal** **luminescence** x ray diffraction

IT Coprecipitation
Doping
Fluorescence
Luminescence
Luminescent substances
Nanocrystals
Particle size
Phosphors
X-ray diffraction
(ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

IT Rare earth metals, properties
Transition metals, properties
(zinc sulfide contg.; ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

IT 62-55-5, Thioacetamide 5970-45-6, Zinc diacetate dihydrate 7440-66-6, Zinc, reactions 7790-86-5, Cerium chloride 10024-93-8, Neodymium chloride 10042-88-3, Terbium chloride 10125-13-0, Copper dichloride dihydrate 10138-41-7, Erbium chloride 10361-92-9, Yttrium chloride

(ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystals**; ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

IT 7440-00-8, Neodymium, properties **7440-27-9**, Terbium, properties 7440-45-1, Cerium, properties 7440-50-8, Copper, properties 7440-52-0, Erbium, properties 7440-65-5, Yttrium, properties 15158-11-9, Copper 2+, properties
(zinc sulfide contg.; ZnS **nanocrystals** co-activated by transition metals and rare-earth metals-a new class of **luminescent** materials)

L54 ANSWER 8 OF 24 HCA COPYRIGHT 2007 ACS on STN

134:10724 Unusual **luminescence** properties of rare-earth and transition-metal ions in very small crystals.. Kushida, Takashi (Nara Inst. Sci. Technol., Japan). Kotai Butsuri, 35(12), 955-959 (Japanese) **2000.** CODEN: KOTBA2. ISSN: 0454-4544. Publisher: Agune Gijutsu Senta.

AB A review with 35 refs. Short decay times with high efficiency of fluorescence reported in Eu^{2+}-doped **microcrystals** and Mn^{2+}-doped **nanocrystals** are discussed. The origin of higher quantum efficiency of UV-excited fluorescence at room temp. in ZnS:Mn **nanocrystals** compared with bulk crystals is also discussed.

IT **7440-53-1**, Europium, properties
(unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, processes
(unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75

ST review rare earth doped **nanocrystal** fluorescence;

manganese doped **microcrystal** short decay review
IT Rare earth metals, properties
Transition metals, properties
(dopants; unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)
IT Electronic transition
Fluorescence
Microcrystallites
Nanocrystals
Oscillator strength
Photonics
(unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)
IT 7439-96-5, Manganese, properties **7440-53-1**, Europium, properties
(unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)
IT **1314-98-3**, Zinc sulfide, processes
(unusual **luminescence** of rare-earth and transition metal ions in nano- and **microcrystals**)

L54 ANSWER 9 OF 24 HCA COPYRIGHT 2007 ACS on STN
133:367400 Photoluminescence of Eu2+ doped ZnS **nanocrystals.**
Liu, Shu-Man; Guo, Hai-Qing; Zhang, Zhi-Hua; Liu, Feng-Qi; Wang, Zhan-Guo (Laboratory of Semiconductor Materials Sciences, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep. China). Chinese Physics Letters, 17(8), 609-611 (English) **2000.** CODEN: CPLEEU. ISSN: 0256-307X. Publisher: Chinese Physical Society.
AB Eu2+ doped ZnS **nanocrystals** exhibit new **luminescence** properties because of the enlarged energy gap of **nanocryst.** ZnS host due to quantum confinement effects. Photoluminescence emission at about 520 nm from Eu2+ doped ZnS **nanocrystals** at room temp. is investigated by using photoluminescence emission and excitation spectroscopy. Such green emission with long lifetime (ms) is proposed to be a result of excitation, ionization, carriers recapture and recombination via Eu2+ centers in **nanocryst.** ZnS host.
IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystal**; photoluminescence of Eu2+ doped ZnS **nanocrystals**)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, properties

(photoluminescence of Eu2+ doped ZnS **nanocrystals**)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST photoluminescence europium doped zinc sulfide **nanocrystal**; green **luminescence** europium doped zinc sulfide **nanocrystal**
IT Electric current carriers
(capture and recombination of; for Eu2+ doped ZnS **nanocrystals**)
IT **Luminescence**
(green; photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT Radiative recombination
(in Eu2+ doped ZnS **nanocrystals**)
IT Band gap
(in **nanocrystals**; photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT Fluorescence
Phosphorescence
(of Eu2+ doped ZnS **nanocrystals**)
IT Size effect
(on photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT Conduction electrons
(recapture and recombination of; photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystal**; photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT **7440-53-1**, Europium, properties 16910-54-6, Europium(2+), properties
(photoluminescence of Eu2+ doped ZnS **nanocrystals**)
IT 557-34-6, Zinc acetate 1313-82-2, Sodium sulfide, reactions 13769-20-5, Europium dichloride
(photoluminescence of Eu2+ doped ZnS **nanocrystals**)

L54 ANSWER 10 OF 24 HCA COPYRIGHT 2007 ACS on STN
133:142431 Cathode ray tubes and **phosphor** screens. Ihara, Masaru; Igarashi, Takahiro; Kusunoki, Tsuneo; Ohno, Katsutoshi (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000215826 A **20000804**, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-12210 19990120.

AB The screens comprise: (1) a glass substrate; (2) a **nanocryst . phosphor emitting** a visible **light** by absorbing a UV light; (3) a bulk **phosphor emitting** a UV **light** by electron beam, where (3)/(2) combinations are: BaSi2O5:Pb / ZnS:Mn (orange **light emitting**) or ZnS:Ag,Al (blue); Ca2MgSi2O7:Ce / ZnS:TbF3 (green) or **ZnS :Tb** (bluish green); Y2SiO5:Ce / ZnS:EuF3 (red) or **ZnS:Eu** (red); Zn2SiO4:Ti / ZnS:EuF3 (red) or **ZnS:Eu** (red); and ZnS:Ag,Ni / ZnS:EuF3 (red) or **ZnS:Eu** (red).

IT **1314-98-3**, Zinc sulfide (ZnS), uses
(**luminous** method of cathode ray tube and fluorescent screen)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(**luminous** method of cathode ray tube and fluorescent screen)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IC ICM H01J029-32
ICS C09K011-08; C09K011-56; C09K011-59; C09K011-79; H01J029-18; H01J029-20

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **phosphor** CRT barium silicate zinc sulfide; calcium magnesium silicate CRT zinc sulfide; yttrium silicate CRT **phosphor**; zinc silicate CRT **phosphor**

IT Cathode ray tubes
Electron beams
Fluorescent substances
Luminescent screens
Nanocrystals
Phosphors

UV and visible spectra
UV radiation
(**luminous** method of cathode ray tube and fluorescent screen)

IT 1314-98-3, Zinc sulfide (ZnS), uses 12027-88-2, Yttrium silicate (Y2SiO5) 13573-15-4, Calcium magnesium silicate (Ca2MgSi2O7) 13597-65-4, Zinc silicate (Zn2SiO4) 13968-67-7, Barium silicate (BaSi2O5)
(**luminous** method of cathode ray tube and fluorescent screen)

IT 7439-92-1, Lead, uses 7439-96-5, Manganese, uses 7440-22-4, Silver, uses **7440-27-9**, Terbium, uses 7440-45-1, Cerium, uses **7440-53-1**, Europium, uses 13708-63-9, Terbium fluoride (TbF3) 13765-25-8, Europium fluoride (EuF3)
(**luminous** method of cathode ray tube and fluorescent screen)

L54 ANSWER 11 OF 24 HCA COPYRIGHT 2007 ACS on STN

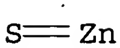
133:80969 Preparation and characterization of rare earth activator doped **nanocrystal phosphors.** Ihara, M.; Igarashi, T.; Kusunoki, T.; Ohno, K. (Sony Corporation, Home Network Company, Atsugi, 243-0021, Japan). Journal of the Electrochemical Society, 147(6), 2355-2357 (English) **2000.** CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB The **luminescent** intensities of **nanocrystal ZnS:Tb** and **ZnS:Eu** synthesized using a new technique were 2.5 and 2.8 times higher than those of bulk **phosphors.** Taking charge compensation into account, the **luminescent** efficiency of the **nanocrystals** can be improved. The cathodoluminescence of the **nanocrystals** was obsd. These **nanocrystal phosphors** are promising for field emission display, **electroluminescence**, plasma-display panels, and cathode ray tubes.

IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystal**; prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)



IT **7440-27-9P**, Terbium, properties **7440-53-1P**, Europium, properties
(prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)

RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66, 74, 76
ST zinc sulfide terbium europium **nanocrystal phosphor** cathodoluminescence **luminescence**
IT Cathodoluminescence
Luminescence
(of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)
IT **Nanocrystals**
Phosphors
(prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)
IT Plasma display panels
(prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors** in relation to)
IT **1314-98-3P**, Zinc sulfide (ZnS), properties
(**nanocrystal**; prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)
IT **7440-27-9P**, Terbium, properties **7440-53-1P**, Europium, properties 22541-18-0P, Europium(3+), properties 22541-20-4P, Terbium(3+), properties
(prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors**)
IT 557-34-6, Zinc acetate 1313-82-2, Sodium sulfide (Na2S), reactions 7681-49-4, Sodium fluoride, reactions 10043-27-3, Terbium nitrate (Tb(NO3)3) 10138-01-9, Europium nitrate (Eu(NO3)3) 13708-63-9, Terbium fluoride (TbF3) 13765-25-8, Europium fluoride (EuF3)
(prepn. and characterization of terbium or europium activator doped **nanocrystal** zinc sulfide **phosphors** using)

L54 ANSWER 12 OF 24 HCA COPYRIGHT 2007 ACS on STN
131:344029 **Phosphors** having a semiconductor host surrounded by

a shell. Gray, Henry F.; Yang, Jianping; Hsu, David S. Y.; Ratna, Banhalli R. (USA). U.S. US 5985173 A **19991116**, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1997-972401 19971118.

AB **Nanocryst. phosphors** with cores with diams. of 1-30 nm comprising a doped semiconductor host material surrounded by an inorg. shell material are described in which the doped semiconductor host material has a first bandgap defining band edges, the shell material has a thickness of less than one-half the diam. of the core and a second bandgap either larger than the first bandgap or having no states within 20-200 meV of the band edges, or offset from the first bandgap so that an electron or hole from the doped host material is reflected back into the doped semiconductor host material. The bicontinuous cubic phase may be formed by mixing a surfactant with a liq. hydrophilic phase in a ratio effective to form the bicontinuous cubic phase, and wherein ≥1 of the surfactant and the liq. hydrophilic phase includes, before mixing, ≥1 of the reactants. The host material may a Group II chalcogenide or other compd. selected from ZnS, ZnO, CaS, SrS, ZnxCd1-xS, Y2O3, Y2O2S, Zn2SiO4, Y3Al5O12, Y3(Al,Ga)5O12, Y2SiO5, LaOCl, InBO3, Gd2O2S, ZnGa2O4, and yttrium niobate; the dopant may comprise Mn; Cu; Ag; Eu; Cu,Cl; Cu,Tb; Tb; Ag,Cl; Cl; Cu,Al; Ce; Er; Er,Cl; or Zn, and the shell may be ZnO or ZnOH. The shell prevents or significantly reduces nonradiative recombination at the surface of the original **phosphor.**

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(**phosphors** based on semiconductor hosts surrounded by shells for nonradiative recombination redn.)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, uses
(**phosphors** based on semiconductor hosts surrounded by shells for nonradiative recombination redn.)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM C09K011-00
INCL 252301400R
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST semiconductor **phosphor** nonradiative recombination preventing shell
IT Coating process
Phosphors
(**phosphors** based on semiconductor hosts surrounded by shells for nonradiative recombination redn.)
IT 7439-96-5, Manganese, uses 7440-22-4, Silver, uses **7440-27-9**, Terbium, uses 7440-45-1, Cerium, uses 7440-50-8, Copper, uses 7440-52-0, Erbium, uses **7440-53-1**, Europium, uses 7440-66-6, Zinc, uses 7782-50-5, Chlorine, uses
(**phosphors** based on semiconductor hosts surrounded by shells for nonradiative recombination redn.)
IT 1314-13-2, Zinc oxide (ZnO), uses 1314-36-9, Yttrium oxide (Y2O3), uses 1314-96-1, Strontium sulfide **1314-98-3**, Zinc sulfide, uses 12005-21-9, Yttrium aluminum oxide (Y3Al5O12) 12027-88-2, Yttrium silicate (Y2SiO5) 12064-18-5, Zinc gallate (ZnGa2O4) 12339-07-0, Gadolinium oxide sulfide (Gd2O2S) 12340-04-4, Yttrium oxide sulfide (Y2O2S) 12442-27-2, Cadmium zinc sulfide 13597-65-4, Zinc silicate (Zn2SiO4) 13709-93-8, Indium borate (InBO3) 13759-25-6, Lanthanum oxychloride (LaOCl) 20548-54-3, Calcium sulfide 36011-55-9, Zinc hydroxide (ZnOH) 60098-66-0, Niobium yttrium oxide 110621-14-2, Yttrium aluminum gallium oxide (Y3(Al,Ga)5O12)
(**phosphors** based on semiconductor hosts surrounded by shells for nonradiative recombination redn.)

L54 ANSWER 13 OF 24 HCA COPYRIGHT 2007 ACS on STN
131:293103 **Phosphor** and its production method. Inohara, Suguru; Kusuki, Tsuneo; Ono, Katsutoshi (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11293241 A **19991026** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-105030 19980415.
AB A **nanocrystal phosphor** having the size of 2-5 nm, suited for use in a field emission display (FED), comprises the ZnS **phosphor** activated by Te or Eu that are charge-compensated by F.
IT **1314-98-3**, Zinc sulfide (ZnS), uses
(**phosphor** for field emission display)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, uses

(**phosphor** for field emission display)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IC ICM C09K011-56
ICS C09K011-08
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
ST **nanocrystal phosphor** zinc sulfide tellurium fluoride europium FED
IT Optical imaging devices
(field emission display; **phosphor** for field emission display)
IT **Phosphors**
(**nanocrystal**; **phosphor** for field emission display)
IT **Nanocrystals**
(**phosphor** for field emission display)
IT **1314-98-3**, Zinc sulfide (ZnS), uses
(**phosphor** for field emission display)
IT **7440-53-1**, Europium, uses 13494-80-9, Tellurium, uses 13765-25-8, Europium fluoride (EuF3) 82868-60-8, Tellurium fluoride (TeF3)
(**phosphor** for field emission display)

L54 ANSWER 14 OF 24 HCA COPYRIGHT 2007 ACS on STN
131:206632 Preparation and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide. Li, Zhengang (Department of Physics, Tianjin Normal University, Tianjin, 300074, Peop. Rep. China). Gongneng Cailiao, 29(Suppl.), 1203, 1205 (Chinese) **1998.** CODEN: GOCAEA. ISSN: 1001-9731. Publisher: Gongneng Cailiao Bianjibu.
AB Three types of ZnS **nanocrystals** doped with Tb as activator element were prepd. by chem. process. The results showed that the sizes of the 3 types of **ZnS:Tb nanocrystals** were 3.6 nm, 3.8 nm and 4.1 nm, and the UV absorptions of the 3 types of **ZnS:Tb nanocrystals** were at 282 nm, 288 nm and 295 nm, which were blue shift from that expected for bandgap of bulk ZnS of 340 nm. The **light emission** peaks of the **ZnS: Tb nanocrystals** were at 548 nm, 547 nm and 546 nm by excitation energy 332 nm laser radiation. The activator Tb3+ was incorporated into the ZnS particles.
IT **7440-27-9**, Terbium, properties

(prepn. and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

IT **1314-98-3P**, Zinc sulfide, properties
(prepn. and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST terbium zinc sulfide **nanocrystal** prepn; optical quantum effect terbium zinc sulfide
IT Laser radiation
Nanocrystals
UV absorption
(prepn. and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide)
IT **7440-27-9**, Terbium, properties
(prepn. and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide)
IT **1314-98-3P**, Zinc sulfide, properties
(prepn. and optical quantum effect of **nanocrystal** terbium-doped zinc sulfide)

L54 ANSWER 15 OF 24 HCA COPYRIGHT 2007 ACS on STN
131:11625 Composite nanophosphor screen for detecting radiation. Bhargava, Rameshwar Nath; Taskar, Nikhil R.; Chhabra, Vishal; Veliadis, John Victor D. (Nanocrystal Imaging Corporation, USA). PCT Int. Appl. WO 9928764 A1 **19990610**, 28 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US25313 19981127. PRIORITY: US 1997-980416 19971128; US 1998-197248 19981120.
AB Composite **phosphor** screens for the conversion of radiation

(e.g., x-rays) impinging thereon to visible light are described which comprise a substrate (e.g., of glass, silicon, or metal) having a planar surface; a multiplicity of microchannels having diams. of <10 μm extending into the surface of the substrate; and a multiplicity of **nanocryst. phosphors** having diams. of <100 nm disposed in each of the microchannels the particles **emitting** visible **light** when exposed to radiation, the microchannels being arranged so as to optically guide the **light emitted.** The walls of the microchannels and/or the substrate surfaces may include light reflective coatings so as to reflect the **light emitted** by the **phosphors** to the light collecting devices, such as film or an electronic detector. The coatings may alternately be either radiation transparent or filtering/attenuating depending on the particular application.

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(**phosphors** activated with; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA

CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, uses
(**phosphors** based on; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM G01T001-20
ICS G21K004-00

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 8, 71, 73

ST **phosphor** screen **nanocryst phosphor** microchannel substrate; radiog screen **nanocryst**

phosphor microchannel substrate
IT **Phosphors**
(**nanocryst.**; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT **Luminescent** screens
Nanocrystals
Radiographic **luminescent** screens
(radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT Glass, uses
Metals, uses
(substrate; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT 7439-96-5, Manganese, uses **7440-27-9**, Terbium, uses 7440-30-4, Thulium, uses **7440-53-1**, Europium, uses
(**phosphors** activated with; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT 1314-36-9, Yttria, uses **1314-98-3**, Zinc sulfide, uses 1317-36-8, Lead oxide (PbO), uses 12064-62-9, Gadolinium oxide (Gd2O3) 12339-07-0, Gadolinium oxide sulfide (Gd2O2S)
(**phosphors** based on; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT 1314-13-2, Zinc oxide (ZnO), uses
(radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-57-5, Gold, uses
(reflective coating; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)
IT 7440-21-3, Silicon, uses
(substrate; radiation-sensitive screens based on **nanocryst. phosphors** in microchannels in substrates)

L54 ANSWER 16 OF 24 HCA COPYRIGHT 2007 ACS on STN
129:251953 Study of the optical properties of Eu3+-doped ZnS **nanocrystals.** Sun, Lingdong; Yan, Chunhua; Liu, Changhui; Liao, Chunsheng; Li, Dan; Yu, Jiaqi (State Key Laboratory of Rare Earth Materials Chemistry and Applications, Peking University, Beijing, 100871, Peop. Rep. China). Journal of Alloys and Compounds, 275-277, 234-237 (English) **1998.** CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science S.A..

AB Absorption and **luminescence** excitation spectra are presented for **ZnS:Eu nanocrystals.** The av. size of the **ZnS:Eu nanocrystals** was .apprx.3.6 nm deduced from the absorption spectra and was independent of the doping concn. of Eu3+. The characteristic **luminescence** from the 5D0-7FJ (J = 0, 1, 2) transition of Eu3+ was obsd. This is attributed to the electrons and holes being localized around Eu3+, and the possibility of energy transfer from band to band excitation in ZnS to trivalent rare earth Eu3+ is increased. The location of Eu3+ is different for different doping concns. deduced from the relative **luminescence** intensity. Three main types of Eu3+ ion exist in the colloid. The samples undergo growth and aging processes according to the variation of the **luminescence** intensity after prepn. A tentative explanation is given that the location of Eu3+ and the surface states may play important roles.

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST europium zinc sulfide **nanocrystal** absorption **luminescence**

IT Energy transfer
 Luminescence
 UV and visible spectra
 (of europium trication-doped zinc sulfide **nanocrystals**)

IT **Nanocrystals**
 (optical properties of europium trication-doped zinc sulfide)

L54 ANSWER 17 OF 24 HCA COPYRIGHT 2007 ACS on STN

129:222662 **Luminescence** characteristics of impurities-activated ZnS **nanocrystals** prepared in microemulsion with hydrothermal treatment. Xu, S. J.; Chua, S. J.; Liu, B.; Gan, L. M.; Chew, C. H.; Xu, G. Q. (Institute of Materials Research and Engineering, National University of Singapore, Singapore, 119260, Singapore). Applied Physics Letters, 73(4), 478-480 (English) **1998.** CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB Cu-, Eu-, or Mn-doped ZnS **nanocryst. phosphors** were prepd. at room temp. using a chem. synthesis method. TEM observation shows that the size of the ZnS clusters is 3-18 nm. New **luminescence** characteristics such as strong and stable visible-**light emissions** with different colors were obsd. from the doped ZnS **nanocrystals** at room temp. Probably impurities, esp. transition metals- and rare earth metals-activated ZnS nanoclusters form a new class of **luminescent** materials.

IT **1314-98-3**, Zinc sulfide, properties
 (impurities-activated **nanocrystals** prepd. in microemulsion with hydrothermal treatment **luminescence**)

RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-53-1**, Europium, uses
(impurity-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment **luminescence**)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **luminescence** impurity activated zinc sulfide **nanocrystal**
IT **Luminescent** substances
(impurities-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment)
IT Rare earth metals, uses
Transition metals, uses
(impurities-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment **luminescence**)
IT **Phosphors**
(**luminescence** of impurities-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment for)
IT Size effect
(**luminescence** of impurities-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment in relation to)
IT **Nanocrystals**
(**luminescence** of impurities-activated zinc sulfide prepd. in microemulsion with hydrothermal treatment)
IT **Luminescence**
Transmission electron microscopy
(of impurities-activated zinc sulfide **nanocrystals** prepd. in microemulsion with hydrothermal treatment)
IT **1314-98-3**, Zinc sulfide, properties
(impurities-activated **nanocrystals** prepd. in microemulsion with hydrothermal treatment **luminescence**)
IT 7440-50-8, Copper, uses **7440-53-1**, Europium, uses
16397-91-4, Manganese(2+), uses
(impurity-activated zinc sulfide **nanocrystals** prepd. in

microemulsion with hydrothermal treatment **luminescence**)

L54 ANSWER 18 OF 24 HCA COPYRIGHT 2007 ACS on STN
129:25370 Dielectric, paramagnetic, or **phosphorescent** nanoparticles biosensor for competition assays. Ewart, Thomas G.; Bogle, Gavin T. (Noab Immunoassay Inc., Can.; Ewart, Thomas G.; Bogle, Gavin T.). PCT Int. Appl. WO 9821587 A1 **19980522**, 86 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1997-CA828 19971107. PRIORITY: US 1996-746420 19961108.

AB Biosensor technol. based on the labeling entities having particle reporters provides cost competitive readily manufd. assay devices. Submicron particles of uniform dimension in metals, polymers, glasses, ceramics and biol. structures such as phages are used as the labeling entities. Such reporter particles greatly increase the sensitivity and accuracy, and provide a variety of assay techniques for detg. analyte presence in a sample. The particles may have dielec., paramagnetic and/or **phosphorescent** properties; such particles are particularly useful in a variety of competition type assays. Novel **phosphor** and phage particles are provided for use as unique labeling entities. Goat anti-human IgG-alk. phosphatase conjugate was treated with ZnS:Cu:Al **phosphor** microparticles and then with glutaraldehyde for crosslinking. The particles were added to wells covalently coated with serially dild. human IgG. The crosslinked goat anti-human IgG-alk. phosphatase bound to the wells in proportion to the concn. of human IgG bound. Another example illustrates direct electron beam excitation of microparticle **phosphors** at ambient pressure.

IT **1314-98-3**, Zinc sulfide (ZnS), biological studies
(inorg. **nanocryst.** semiconductor dopants; Mn, Cu, Al, Ag and Tb doped, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S=Zn

IT **7440-27-9**, Terbium, uses
(inorg. **nanocryst.** semiconductor dopants; dopant for

Zinc sulfide, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

IT **7440-53-1**, Europium, uses
(**phosphor** microparticles; Y2O2S dopant, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IC ICM G01N033-543
ICS G01N033-58; G01N027-327; G01N027-22; G01N021-64; C12N007-00; C12Q001-68
CC 9-1 (Biochemical Methods)
Section cross-reference(s): 7, 15, 52
ST dielec nanoparticle biosensor competition assay; paramagnetic nanoparticle biosensor competition assay; **phosphorescence** nanoparticle biosensor competition assay
IT Immunoglobulins
(G, conjugates, goat anti-human, with alk. phosphatase; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Phosphorimetry
(app. for; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Amines, biological studies
Amines, biological studies
(aryl, tertiary, polymers, hole transporter dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Avidins
(conjugates with alk. phosphatase; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Rare earth metals, biological studies
(cryptates, solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Biosensors

(diagnostic; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Capacitors
Electrodes
Immunoassay
Nucleic acid hybridization
Particles
(dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Gene
(dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Analysis
(displacement competition assay; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Electric transport properties
(electron and hole transporters, solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Fullerenes
Polyoxadiazoles
(electron transporter dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Polycyclic compounds
(fluorescent, solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Fluoropolymers, uses
(heat-shrink tubing, in **phosphorescence** microparticle sensors; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Gel electrophoresis
Membranes, nonbiological
(in nucleic acid sequencing or hybridization assay app.; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Semiconductor materials
(inorg. **nanocryst.**, solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Semiconductor devices
(microchips; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT Particles
(paramagnetic; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Bacteriophage
Electric insulators
Phosphors
(particles; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Analytical apparatus
(**phosphorescence**; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Microparticles
Nanoparticles
(reporter; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Nucleic acids
(sequencing; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Polymers, biological studies
(solid semiconductor **phosphors**; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Metalloporphyrins
Rare earth complexes
(solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Polythiophenylenes
(solid-phase semiconductor polymer **phosphor** reporter label; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Dopants
(solid-phase semiconductor polymer; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Dyes
(squarilium, solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT Pipes and Tubes
(stainless steel, in **phosphorescence** microparticle sensors; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)
IT 9001-78-9DP, Alkaline phosphatase, conjugates with avidin or goat

anti-human IgG and crosslinked with glutaraldehyde to cage **phosphor** microparticles
(dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 111-30-8, Glutaraldehyde
(dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 494-72-4, Diphenoquinone 1989-32-8 7429-90-5D, Aluminum, quintolates, biological studies
(electron transporter dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 9002-84-0, Teflon
(heat-shrink tubing, in **phosphorescence** microparticle sensors; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 1306-23-6, Cadmium sulfide (CdS), biological studies
(inorg. **nanocryst.** semiconductor dopants; Mn doped, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT **1314-98-3**, Zinc sulfide (ZnS), biological studies
(inorg. **nanocryst.** semiconductor dopants; Mn, Cu, Al, Ag and Tb doped, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT **7440-27-9**, Terbium, uses
(inorg. **nanocryst.** semiconductor dopants; dopant for Zinc sulfide, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT **7440-53-1**, Europium, uses
(**phosphor** microparticles; Y2O2S dopant, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 12340-04-4, Yttrium oxide sulfide (Y2O2S)
(**phosphor** microparticles; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses
(**phosphor** microparticles; zinc sulfide dopant, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 132-65-0D, Dibenzothiophene, compds. 486-25-9D, Fluorenone, compds. 32283-92-4, N,N'-Bis(3-aminophenyl)-3,4,9,10-perylenetetracarboxylic diimide 76372-76-4, N,N'-Bis(2,6-dimethylphenyl)-3,4,9,10-perylenetetracarboxylic diimide 83054-80-2
(polycyclic org. fluorescent dopants; dielec. and paramagnetic

and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 198-55-0D, Perylene, compds. 289-74-7, Thiapyrylium 574-93-6D, Phthalocyanine, compds. 1047-16-1D, Quinacridone, compds. 1254-43-9 23627-89-6D, Naphthalocyanine, compds.
(solid-phase semiconductor polymer dopants; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 4499-83-6 25067-59-8, Poly(vinylcarbazole) 25190-62-9, Poly(1,4-phenylene) 25233-30-1, Poly(aniline) 51325-05-4, Poly(thienylene) 66280-99-7, Poly(thienylenevinylene) 76188-55-1, Poly(methylphenylsilane) 96638-49-2, Poly(phenylenevinylene) 123863-98-9, Poly(9,9-dihexylfluorene) 146088-00-8, Poly(methylphenylsilane) 197500-59-7
(solid-phase semiconductor polymer **phosphor** reporter label; dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

IT 7439-96-5, Manganese, uses 7440-22-4, Silver, uses
(zinc sulfide dopant, dielec. and paramagnetic and or **phosphorescent** nanoparticles biosensor for competition assays)

L54 ANSWER 19 OF 24 HCA COPYRIGHT 2007 ACS on STN

127:269825 Probing the microstructure in semiconductor layer materials using synchrotron radiation. Kao, Y. H. (Department of Physics, State University of New York at Buffalo, Amherst, NY, 14260, USA). Chinese Journal of Physics (Taipei), 35(4), 353-364 (English) **1997.** CODEN: CJOPAW. ISSN: 0577-9073. Publisher: Physical Society of the Republic of China.

AB Advances in modern electronics and photonics depend crucially on tech. capabilities to control the size, compn., and morphol. of semiconductor layer structures. To exploit this important class of materials such as quantum wells and superlattices for technol. applications, phys. understanding of microscopic structures on the nanometer scale is needed. It is well known that short-range-order microstructures, such as interfacial roughness, intermixing of constituent atoms, strain and local environment surrounding different at. species, and effects arising from lattice mismatch, can play a pivotal role in controlling some important phys. properties of quantum heterostructures and superlattices. These microstructures are important for electronic band structure engineering, but cannot be studied in detail by conventional diffraction methods which are based on an averge over many interat. distances. Other characterization methods such as electron microscopy, STM, **luminescence**, and Raman scattering, either cannot maintain the integrity of the as-made layer structures, or only provide limited indirect information on the fine-scale structure of buried interfaces in these materials. The

advent of polarized, tunable, high-intensity x-rays from synchrotron radiation make it possible to probe the detailed microscopic structures in ways unavailable previously. The interaction between man-made nanometer-size layer structures and tunable x-rays with wave lengths comparable to the layer thickness, can provide excellent opportunities for exploring some novel phys. phenomena by making use of the rather unusual condition of both optical and charge-carrier confinement in the thin films. By way of examples, some recent results based on this approach are presented. A significant amt. of review material is included.

IT **1314-98-3**, Zinc sulfide, properties
(**nanocrystals**; probing microstructure in semiconductor layer materials using synchrotron radiation)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IT **7440-27-9**, Terbium, properties
(probing microstructure in semiconductor layer materials using synchrotron radiation)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

CC 73-6 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66

ST semiconductor layer microstructure synchrotron radiation spectroscopy; quantum wire microstructure synchrotron radiation spectroscopy; x ray scattering semiconductor layer microstructure; fluorescence x ray semiconductor layer microstructure; **luminescence** semiconductor layer microstructure; diffractometry x ray semiconductor layer microstructure; interface roughness semiconductor layer synchrotron spectroscopy; well quantum microstructure synchrotron radiation spectroscopy; order short range semiconductor layer synchrotron; germanium silicon heterostructure microstructure synchrotron spectroscopy; gallium arsenide indium microstructure synchrotron spectroscopy; magnesium arsenide microstructure synchrotron spectroscopy; **nanocrystal** zinc sulfide manganese synchrotron spectroscopy; zinc selenide sulfide iron synchrotron spectroscopy; telluride zinc selenide heterostructure microstructure spectroscopy; terbium yttria **nanocrystal** radioluminescence green EXAFS; review semiconductor layer microstructure synchrotron spectroscopy; STM

semiconductor layer microstructure; magnetic semiconductor layer microstructure synchrotron; MBE semiconductor layer microstructure synchrotron spectroscopy; MOCVD semiconductor layer microstructure synchrotron spectroscopy

IT EXAFS spectra
Interface roughness
Luminescence
Magnetic semiconductor materials
Microstructure
Molecular beam epitaxy
Nanocrystals
Quantum well devices
Quantum well heterojunctions
Quantum wire devices
Quantum wire devices
Raman spectroscopy
Scanning tunneling microscopy
Semiconductor lasers
Semiconductor superlattices
Short-range order
Strain
Synchrotron radiation
X-ray diffractometry
X-ray scattering
XAFS spectra
XAFS spectroscopy
(probing microstructure in semiconductor layer materials using synchrotron radiation)

IT **1314-98-3**, Zinc sulfide, properties
(**nanocrystals**; probing microstructure in semiconductor layer materials using synchrotron radiation)

IT 7439-96-5, Manganese, properties **7440-27-9**, Terbium, properties
(probing microstructure in semiconductor layer materials using synchrotron radiation)

L54 ANSWER 20 OF 24 HCA COPYRIGHT 2007 ACS on STN

125:341642 Investigation of local structures around **luminescent** centers in doped **nanocrystal phosphors.** Soo, Y. L.; Huang, S. W.; Ming, Z. H.; Kao, Y. H.; Goldburt, E.; Hodel, R.; Kulkarni, B.; Bhargava, R. (Dep. Phys., State Univ. New York, Buffalo, NY, 14261, USA). Materials Research Society Symposium Proceedings, 405(Surface/Interface and Stress Effects in Electronic Material Nanostructures), 283-288 (English) **1996.** CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB Extended x-ray absorption fine structure (EXAFS) technique was employed to study the local structures around **luminescent** centers in **nanocrystals** of Mn-doped **ZnS** and

Tb-doped Y2O3. Size-dependent local structure changes around Mn **luminescent** centers were found in Mn-doped **nanocrystals** of ZnS by using Mn K-edge EXAFS. Local structures around Tb studied by Tb L2-edge EXAFS also show substantial differences between bulk and **nanocrystal** samples. This structural information is useful for understanding the novel optical properties of doped **nanocrystals.**

IT **7440-27-9**, Terbium, properties
(local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

RN 7440-27-9 HCA

CN Terbium (CA INDEX NAME)

Tb

IT **1314-98-3**, Zinc sulfide (ZnS), properties
(local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

RN 1314-98-3 HCA

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S══Zn

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **phosphor luminescence** center local structure EXAFS; zinc sulfide manganese **luminescence** center EXAFS; yttrium oxide terbium **luminescence** center EXAFS

IT **Luminescence**
Phosphors
Recombination of electron with hole
(local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

IT X-ray spectra
(EXAFS, local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

IT 7439-96-5, Manganese, properties **7440-27-9**, Terbium, properties
(local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

IT 1314-36-9, Yttrium oxide (Y2O3), properties **1314-98-3**,

Zinc sulfide (ZnS), properties
(local structures around **luminescent** centers in doped **nanocrystal phosphors** for manganese-doped zinc sulfide and terbium-doped yttria)

L54 ANSWER 21 OF 24 HCA COPYRIGHT 2007 ACS on STN
124:327559 Doped semiconductor and insulator **nanocrystalline phosphors.** Goldburt, E. T.; Bhargave, R. N. (Nanocrystals Technology, Briarcliff Manor, NY, 10510, USA). Proceedings - Electrochemical Society, 95-25(Advanced Luminescent Materials), 368-381 (English) **1996.** CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.

AB This work represents expansion of previous work on Mn-doped ZnS and concs. on prepn. and optical spectrometry of Mn, Eu, and Tb doped into **nanocrystals** of **ZnS** and **Eu** and Tb doped into **nanocrystals** of yttria. Novel doped **nanocryst. phosphors** were prepd. using room temp. organometallic synthesis for Zn sulfide and sol-gel processing for yttria host resp. Tb and Eu were used as dopants in both hosts. TEM and photoluminescence and photoluminescence excitation spectrometry yield a typical particle size in the range 40-50 Å. Comparison with std. **phosphor**, Tb-doped LaOBr, shows that Tb-doped yttria **nanocryst. phosphor** yields .apprx.30% light output upon 250 nm excitation.

IT **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(doped semiconductor and insulator **nanocryst. phosphors**)

RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

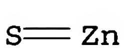
IT **1314-98-3**, Zinc sulfide, properties
(doped semiconductor and insulator **nanocryst. phosphors**)

RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **phosphor** manganese zinc sulfide yttria doped; zinc sulfide europium manganese terbium **phosphor**; yttria europium terbium **phosphor**; europium yttria zinc sulfide **phosphor**; terbium yttria zinc sulfide **phosphor**
IT **Luminescence**
Particle size
Phosphors
(doped semiconductor and insulator **nanocryst. phosphors**)
IT 7439-96-5, Manganese, uses **7440-27-9**, Terbium, uses **7440-53-1**, Europium, uses
(doped semiconductor and insulator **nanocryst. phosphors**)
IT 107-92-6, Butanoic acid, properties 109-72-8, n-Butyl lithium, properties 112-80-1, Oleic acid, properties 544-97-8, Dimethyl zinc 1314-36-9, Yttria, properties **1314-98-3**, Zinc sulfide, properties 2386-64-3, Ethyl magnesium chloride 7773-01-5, Manganese dichloride 9011-14-7, PMMA
(doped semiconductor and insulator **nanocryst. phosphors**)

L54 ANSWER 22 OF 24 HCA COPYRIGHT 2007 ACS on STN
124:188941 Glass matrix doped with activated **luminescent nanocrystalline** particles. Huston, Alan L.; Justus, Brian C. (United States Dept. of the Navy, USA). U. S. Pat. Appl. US 371306 A0 **19951115**, 29 pp. Avail. NTIS Order No. PAT-APPL-8-371 306. (English). CODEN: XAXXAV. APPLICATION: US 1995-371306 19950111.
AB **Luminescent** glasses include **nanocryst.** semiconductor particles (e.g., ZnS or KCl **nanocrystals**) and an activator (e.g., Cu or Eu) for the particles. The glass is made by depositing the **nanocryst.** semiconductor particles and the activator within a porous glass matrix (e.g., of 7930 Vycor) and then themally activating the glass. The porous glass matrix may be at least partially consolidated or may be allowed to remain porous. The nanometer particle size permits the **luminescent** glasses to be transparent to the **luminescent** emissions.
IT **1314-98-3**, Zinc sulfide, uses
(copper-doped; glass matrix doped with activated **luminescent nanocryst.** particles)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)



IT **7440-53-1**, Europium, uses
(glass matrix doped with activated **luminescent nanocryst.** particles)
RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **luminescent nanocryst** particle doped glass
IT **Luminescent** substances
(glass matrix doped with activated **luminescent nanocryst.** particles)
IT Glass, oxide
(glass matrix doped with activated **luminescent nanocryst.** particles)
IT Semiconductor materials
(**luminescent**; glass matrix doped with activated **luminescent nanocryst.** particles)
IT **1314-98-3**, Zinc sulfide, uses
(copper-doped; glass matrix doped with activated **luminescent nanocryst.** particles)
IT 7447-40-7, Potassium chloride, uses
(europium-doped; glass matrix doped with activated **luminescent nanocryst.** particles)
IT 7440-50-8, Copper, uses **7440-53-1**, Europium, uses
(glass matrix doped with activated **luminescent nanocryst.** particles)

L54 ANSWER 23 OF 24 HCA COPYRIGHT 2007 ACS on STN
123:69886 Pumped solid-state lasers comprising doped **nanocrystal phosphors.** Bhargava, Rameshwar N. (USA). U.S. US 5422907 A **19950606**, 17 pp. (English). CODEN: USXXAM. APPLICATION: US 1994-246944 19940520.
AB Optically-pumped or electron-beam-pumped solid-state lasers are described which employ laser-active media based on activator-doped **nanocrystal** particles which as a result of quantum confinement can be caused to exhibit discrete levels in the conduction band that can overlap with the corresponding levels in the doping activator so that resonant energy transfer of excited carriers from the conduction band of the **phosphor** host to that of the activator will occur. The result is an energy level structure similar to that of a four-level laser but capable of more efficient conversion of the pumping energy to photon generation.
IT **7440-27-9**, Terbium, properties **7440-53-1**, Europium, properties

(solid-state lasers employing doped **nanocrystal** active media)
RN 7440-27-9 HCA
CN Terbium (CA INDEX NAME)

Tb

RN 7440-53-1 HCA
CN Europium (CA INDEX NAME)

Eu

IT **1314-98-3**, Zinc sulfide, properties
(solid-state lasers employing doped **nanocrystal** active media)
RN 1314-98-3 HCA
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S═Zn

IC ICM H01S003-14
INCL 372068000
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST doped **nanocrystal** solid state laser
IT Group IIB element chalcogenides
(activator-doped; solid-state lasers employing doped **nanocrystal** active media)
IT Lasers
(solid-state, solid-state lasers employing doped **nanocrystal** active media)
IT 7439-96-5, Manganese, properties **7440-27-9**, Terbium, properties 7440-30-4, Thulium, properties **7440-53-1**, Europium, properties
(solid-state lasers employing doped **nanocrystal** active media)
IT **1314-98-3**, Zinc sulfide, properties
(solid-state lasers employing doped **nanocrystal** active media)

L54 ANSWER 24 OF 24 HCA COPYRIGHT 2007 ACS on STN
97:30698 Evidence of electron multiplication in **microcrystalline** zinc sulfide. Dai, Rensong; Xu, Xurong (Changchun Inst. Phys., Changchun, Peop. Rep. China). Journal of Physics C: Solid State Physics, 15(8), 1781-5 (English) **1982.** CODEN: JPSOAW.

ISSN: 0022-3719.

AB The criterion for electron multiplication in the presence of an elec. field is established for **microcryst.** materials by comparing and analyzing the addnl. light peaks on the background of photoluminescence and **electroluminescence.** The exptl. result showed that the electron multiplication process was rather dominant in **microcryst. ZnS**(Cu, **Eu**, Cl) when an elec. field is present. In an elec. field of 2 + 104 V cm-1 the multiplication coeff. is >22.

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST zinc sulfide **microcryst** electron multiplication; **luminescence microcryst** zinc sulfide; **electroluminescence microcryst** zinc sulfide

IT Electron, conduction
(multiplication of, in **microcryst** zinc sulfide contg. copper chloride and europium trichloride, photo- and **electroluminescence** in study of)

IT **Luminescence**
Luminescence, electro-
(of **microcryst.** zinc sulfide contg. copper chloride and europium trichloride, electron multiplication in relation to)

IT 7758-89-6 10025-76-0
(electron multiplication in **microcryst.** zinc sulfide contg., photo- and **electroluminescence** in study of)

IT 1314-98-3, properties
(electron multiplication in **microcryst.**, photo- and **electroluminescence** in study of)